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ENVIRONMENTAL ASSESSMENT BOARD



ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 5

DATE: Monday, April 29, 1991

BEFORE:

HON. MR. JUSTICE E. SAUNDERS CHAIRMAN

DR. G. CONNELL MEMBER

MS. G. PATTERSON MEMBER

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,
R.S.O. 1980, c. 140, as amended, and Regulations
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro
consisting of a program in respect of activities
associated with meeting future electricity
requirements in Ontario.

Held on the 5th Floor, 2200
Yonge Street, Toronto, Ontario,
on Monday, the 29th day of April,
1991, commencing at 9:00 a.m.

VOLUME 5

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MS. G. PATTERSON Member

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1 ---Upon commencing at 9:07 a.m.

2 MR. HARPUR: Good morning. Welcome to
3 the scoping of Panel 2.

4 On Thursday, Mr. Nunn and I met with Mrs.
5 Formusa and Ms. Harvie and we had an opportunity to
6 discuss the state of affairs as between Hydro and the
7 intervenors on the statements of concerns and the
8 statement of proposed issues. We understand from our
9 discussion that, except for some minor changes to the
10 matters deferred list, which accompanies the statement
11 of proposed issues, there is general agreement with the
12 format of Hydro's document. I hope to flesh out the
13 discrepancies.

14 MR. WATSON: I wouldn't want to go quite
15 that far. I think it is fair to say there is some
16 concern between the MEA and Hydro with respect to the
17 significance of reserve margin focus in Panel 2. That
18 may be a little bit more than you would characterize
19 it.

20 MR. HARPUR: Fair enough. I will find
21 out about that in due course, no doubt.

22 ---Off the record discussion.

23 MR. HARPUR: First on my list, Mrs.
24 Formusa, is a discovery of where matters stand with
25 those people to whom you had not spoken by the time of

1 our discussion on Friday afternoon, and perhaps I could
2 just go through the list briefly and confirm those who
3 are on side, as it were, and those who are not.

4 Energy Probe remains unspoken to?

5 MRS. FORMUSA: That's correct.

6 MR. HARPUR: Northwatch, same thing?

7 MRS. FORMUSA: Correct.

8 MR. HARPUR: The Municipal Electric
9 Association you have now spoken to, Mr. Watson, and
10 there are some things that have to be addressed, is
11 that correct?

12 MR. WATSON: There is really only one
13 issue. We have had ongoing discussions for the last
14 week and we have resolved everything except for this
15 one issue.

16 MR. HARPUR: I take it that everyone who
17 is in the room right now has a copy of the updated
18 documents that Hydro has produced. The statement of
19 proposed issues, I believe, is the same as you have
20 already seen. There are some changes to the matters
21 deferred list and the changes from what you had
22 previously have been asterisked to denote those
23 changes.

24 Mr. Kelsey, I see you are here. Have you
25 had an opportunity to discuss with Hydro either of

1 these documents?

2 MR. KELSEY: No, I haven't. I was in
3 Windsor last week and I didn't get back until late
4 Saturday night and I didn't think that was an
5 appropriate time to call Laura and start discussing
6 scoping.

7 MR. HARPUR: Fair enough. Perhaps before
8 I get the panel to come in this morning, you will have
9 opportunity to speak to her and let me know where the
10 two of you stand.

11 MR. KELSEY: Yes.

12 MR. HARPUR: South Bruce, as I understand
13 it, has not been spoken to?

14 MR. POWER: We have now. I think we have
15 resolved our concerns.

16 MR. HARPUR: Thank you.

17 North Shore Tribal Council?

18 MS. MARLATT: We have discussed our
19 concerns and they have been sorted out.

20 MR. HARPUR: Thank you.

21 AMPCO I understand shares some of the
22 concerns Mr. Watson has, Mr. Rodger; is that correct?

23 MR. RODGER: That's correct.

24 MR. HARPUR: And you intend to address
25 that this morning?

1 MR. RODGER: Yes.

2 MR. HARPUR: Solar Energy of Canada, are
3 they present this morning?

4 MS. PURDY: No, they are not. I am
5 Sheila Purdy. I will be speaking to them later on and
6 they may have some concerns to raise.

7 MR. HARPUR: Do you know when it is you
8 will know about those concerns or have a chance --

9 MS. PURDY: About ten minutes.

10 MR. HARPUR: Okay. NAPA, is anyone here
11 for NAPA?

12 MRS. FORMUSA: I understood they were
13 coming.

14 MR. HARPUR: The Ontario Metis and
15 Aboriginal Association?

16 Northumberland Environmental Protection?

17 Well again, I guess, in the
18 circumstances, what I will do is hope that before we
19 get the panel in, you are in a position, Laura, to
20 speak to the representatives of those parties.

21 By way of general comment, I think I can
22 say that there was some initial puzzlement with the
23 idea of deferring detail on the environmental
24 performance of the existing system to the various
25 option panels. However, the Board is content, given

1 what appears to be a general consensus, subject to what
2 we are going to hear this morning, the Board is content
3 with the idea that the matters be presented as they are
4 going to be, which, I understand, in effect, to be an
5 overview of the environmental effects of the existing
6 system, so long as the participants on subsequent
7 panels are in a position to, and indeed do, provide a
8 sufficient level of detail concerning environmental
9 effects. Health hazards, for example, of the various
10 components of the existing system apparently is
11 something that is being deferred to subsequent panels.

12 The Board is content with that, but does
13 expect that those people who are on those subsequent
14 panels are equipped to handle detailed questioning,
15 either in the direct or in cross.

16 MRS. FORMUSA: Again, as I mentioned to
17 the various parties, that would be subject to any
18 submissions we might make at the time with respect to
19 the scope of the cross-examination, the level of detail
20 that's pursued and, in some cases perhaps, relevancy,
21 but we will have witnesses who will be prepared to
22 speak to those issues.

23 MR. HARPUR: Thank you.

24 I understand as well that when one sees
25 the words "in part" in your list of matters deferred,

1 it is the detailed part that is being deferred and the
2 general part that is being retained; is that accurate?

3 MRS. FORMUSA: That's correct.

4 MR. HARPUR: I emphasize, probably
5 without need, that given what I have said, the Board is
6 anxious that there not be duplication either in direct
7 evidence subsequently or in the cross-examination
8 subsequently of these witnesses, and I am thinking
9 particularly of environmental effects.

10 The fact that consensus has been reached,
11 subject to the matters to be addressed now, leaves me
12 with very little else to say. Perhaps what I could do
13 at this stage is ask those people who have concerns,
14 who have discussed matters with Hydro and who have
15 concerns about the documents in front of us, express
16 those concerns now.

17 Mr. Watson, would you like to begin?

18 MR. WATSON: Certainly. I suppose the
19 simple way to characterize this situation is by looking
20 at some of the other issues that have arisen in Panel
21 2; for instance, the environmental matters that you
22 have mentioned, transmission, the general area of
23 rehabilitation. In dealing with all of those areas, I
24 believe Hydro and the various intervenors have agreed
25 that these issues are relevant in a number of panels

1 and have come to the agreement that general overview
2 will be dealt with in Panel 2 and the specifics dealt
3 with later.

4 This issue also arises with respect to
5 reserve margin, and in fairness to Hydro, there is no
6 question that issues dealing with reserve margin are
7 relevant to Panel 2.

8 Also in fairness to Hydro, they agree
9 that the reserve margin issues are relevant in the
10 later planning cluster, what has been characterized as
11 Panels 3, 10 and 11.

12 MR. HARPUR: I'm sorry, 3, 10 and 11?

13 MR. WATSON: 3, 10 and 11, what I call
14 the planning cluster.

15 Where the disagreement arises is in the
16 focus to be given to reserve margin, where that focus
17 should occur.

18 It's fair to say that Hydro feels that
19 the focus for reserve margin should be in Panel 2
20 dealing with the existing system, and the MEA feels
21 that the focus should be later in the planning cluster.
22 We are quite prepared to deal with it in a general
23 context in planning in Panel 2, but we feel that the
24 emphasis should be at a later panel, in effect, using
25 the same philosophy that has been adopted for all of

1 these other issues, the environmental issues,
2 transmission issues, and the rehabilitation issues,
3 just to name a few.

4 MR. HARPUR: May I stop you for a moment
5 and find out if it's the case that on Panel 2 are
6 witnesses who are in a position to provide a real level
7 of detail about the reserve capability?

8 MR. WATSON: My understanding is that
9 Hydro has put two witnesses on Panel 2 who are quite
10 prepared to deal with this, Mr. Taborek and Mr.
11 Snelson; is that correct?

12 MRS. FORMUSA: Yes.

13 MR. WATSON: I understand from the
14 witness statement that Mr. Snelson was also appearing
15 on Panel 10, which would be in the planning cluster,
16 although Mr. Taborek is not appearing at the later
17 panel. Perhaps a practical solution would simply be to
18 have Mr. Taborek also appear at a later panel. Of
19 course, that does bring us down to the issue that you
20 raised just a few minutes ago with respect to concerns
21 about duplication and repetition. I would hope that
22 wouldn't occur, due to the way that the MEA looks at
23 reserve margin.

24 MR. HARPUR: Can you explain to me why do
25 you say that the focus ought to be later?

1 MR. WATSON: Certainly. It appears as
2 though there are two different ways of looking at the
3 reserve margin. If, in fact, you simply determine what
4 your reserve margin is going to be, for instance, say,
5 24 per cent, and you then have a very simple situation
6 to implement that in your system.

7 However, the MEA feels that reserve
8 margin has to be looked at from a planning perspective.
9 And in fact, looking at the actual plan before it
10 itself, you will see on page 414 a sentence about
11 two-thirds of the way down the page that says,
12 "Planning seeks to minimize the customer total cost by
13 seeking an optimum unit size and appropriate system
14 reserve margin."

15 The whole focus of the MEA's point here
16 is that this is a system planning issue. We will feel
17 that in order to appropriately determine what your
18 reserve margin is, you, in effect, have to try and
19 optimize the system. You have to look at things like
20 characteristics of the load, the effect of demand
21 management and conservation, load shedding programs.

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...

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1 [9:21 a.m.] You have to look at your supply mix in
2 the future. That not only envisages looking at the
3 existing system but how it interacts with the major new
4 supply options, the effective NUGS in the future
5 system. You have to look at rehabilitation and life
6 extension and redevelopment of new -- sorry, of the
7 existing options.

8 And putting it very simply, what you need
9 to know is all of the information from the later
10 panels. You incorporate this into a planning cluster
11 and you optimize the system to obtain the appropriate
12 reserve margin. If you do not do this, then, very
13 simply, what it indicates is that you have a
14 preconception of what your mix is going to be.

15 Let me give you an example of that:

16 If you look at, I believe it is table 416
17 in the plan, you will see a list of various reserve
18 margins. If you look at the reserve margin for Quebec
19 Hydro, you will see instead of 24 per cent for Ontario
20 Hydro, it has a very low reserve margin of 10 per cent.
21 That is understandable in the context of the Quebec
22 mix, which has a high preponderance of hydraulic
23 reserves with a high reliability associated with it;
24 therefore they can afford the low reserve margin.

25 In effect, if you determine your reserve

1 margin, you already have a preconception of what the
2 mix will be and, very simply, you have to know what is
3 happening in the later panels, plug that into the
4 planning cluster, and then, going through your true
5 least cost planning exercise, you come up with a
6 reserve margin.

7 I can go on for a little bit longer if
8 you would like, but that is the essence of it.

9 MR. HARPUR: Would you have Hydro delete
10 the reserve margin evidence from Panel 2 or simply
11 overview it as they're doing with environmental
12 performance?

13 MR. WATSON: No, I tried to make that
14 clear at the start and I think I should emphasize that
15 once again. There is no doubt that both Hydro and the
16 MEA feel that reserve margin is a relevant issue for
17 Panel 2. And also Hydro and MEA feel that it is a
18 relevant issue for the planning cluster. There is no
19 doubt about that.

20 How I characterized it in my
21 conversations with Hydro counsel, just by way of an
22 example, and these figures are not based on anything,
23 but the MEA feels that it is a 30/70 type of situation
24 with respect to the weight to be focused on Panel 2 and
25 the later planning cluster. And Hydro, in effect, has

1 the opposite view: they feel it should be 70/30.

2 I don't want to be seen as wedded to that
3 particular figure, but that's just a way of
4 illustrating the fact that there is -- while there is
5 agreement on the relevance, it's a difference of
6 opinion on the focus to be attached to the issue.

7 MR. HARPUR: Thank you.

8 Mrs. Formusa.

9 MRS. FORMUSA: I guess I have a number of
10 points in response. First of all, I just want to make
11 clear that we have had a number of discussions both
12 with you and others about the purpose of this panel,
13 and we talked about it being an overview panel. I
14 think that that's correct to a certain extent. It also
15 provides background information, descriptive
16 information.

17 But we shouldn't lose sight that this is
18 a key panel for determining, for beginning to
19 determine, the requirements for discussion of demand
20 and supply options. So it goes beyond mere description
21 and overview, and I think that's where the reserve
22 margin plays a key role and why we have put Mr. Taborek
23 on this panel and made references to the chapter in the
24 plan analysis report, to Exhibit 87, which is the more
25 recent review of the reliability criteria.

1 Reserve margin is critical to this panel
2 with respect to the subject of load meeting capability
3 of the existing system. It's a system-wide
4 consideration. It's not tied to a particular option,
5 as you might argue if you take the analogy with respect
6 to environmental or technical performance of a
7 particular fossil or nuclear option. It's not tied
8 to -- it's not option-specific; it's more concerned
9 with the system considerations and the mix of options,
10 and that's why we come back to it in Panel 10.

11 So I don't disagree that we must come
12 back to it. We have to come back and reconfirm that
13 the reserve margin is appropriate for the plans that
14 are developed, but it's important in establishing at
15 the outset what the requirements are to know what the
16 load meeting capability of the system is, the existing
17 system. You can't know that unless you know what the
18 reserve margin, or the range of margin, is.

19 The other important thing to note is
20 that, until about the turn of century, the existing
21 system was the major driver of what we have got. There
22 aren't - correct me if I am wrong - there aren't many
23 options that come into place during that time that will
24 change the mix of options that we have on the existing
25 system. So, for about half the planning period, you

1 have got the system as it is with the mix of options
2 that we currently have.

3 So, I can only say the reserve margin is
4 critical to the considerations in this panel, and we
5 shouldn't simply view this panel as an overview panel.
6 I think that that point is key for this panel to
7 establish.

8 MR. HARPUR: Right. Thank you.

9 Are there others who intend to address
10 the Board about this issue? And if so, could I hear
11 about your concerns now?

12 Mr. Power, did you want to speak to this
13 issue as well?

14 MR. POWER: Actually I had one question
15 which I hadn't discussed with Laura. I assume it's
16 open to ask questions regarding how the reserve margin
17 is presently used.

18 MRS. FORMUSA: In terms of how?

19 MR. POWER: How it is presently used.

20 MRS. FORMUSA: This panel will deal with
21 it.

22 MR. POWER: That would be our only
23 concern.

24 MR. HARPUR: Okay.

25 MR. RODGER: I would just echo Mr.

1 Watson's comments: We have the same concern. We
2 recognize that it is appropriate to deal with reserve
3 margin in Panel 2, but in order to determine in the
4 long run whether that reserve margin is appropriate, we
5 also have to look at the options to see what your
6 strengths and weaknesses are for meeting demand and
7 reducing demand. It's only after you look at that
8 analysis that we can see at the end of day whether the
9 targets are appropriate.

10 MRS. FORMUSA: I guess if I might just
11 interrupt again, Michael. In terms of doing that, I
12 agree that one must come back to the reserve margin.
13 But we have to deal with in one place about the nuts
14 and bolts of that reserve margin and that's what we
15 propose to do.

16 We have exercised some judgment, in fact,
17 a long time ago to do that in this panel. It is not
18 something that can be split up easily over the various
19 panels and we will tell you a little bit about it here
20 because it's relevant not just to this option.

21 It really is a package of information in
22 terms of how you do it, how others do it, how our
23 reserve margin compares with other utilities. It's
24 very difficult to say that you shouldn't deal with that
25 in one place; and to leave that discussion until the

1 very end, well, in our judgment, is not appropriate.

2 MR. HARPUR: Mr. Starkman.

3 MR. STARKMAN: Michael, I don't know if I
4 would speak to the panel about this, but I frankly
5 still do not understand the nature of the dispute.
6 Everyone seems to agree that it is on Panel 2 under
7 existing system. People can ask questions about but it
8 is also relevant to the options discussion, and I
9 guess, in part, it is a question of where the emphasis
10 goes. And isn't that something that the panel will
11 have to sort out on a question-by-question or
12 area-by-area decision in the context of the hearing? I
13 don't hear what is going to be resolved by the panel.
14 They are going to say --

15 MR. HARPUR: Well, to this extent, David,
16 it seems to me that if we don't say something now about
17 how we are to approach Panel 2, insofar as reserve
18 margin is concerned, is it a 30/70 approach or a 70/30
19 approach? Do you bring all your guns to this panel or
20 do you hold them for a later one?

21 If people are operating on different
22 assumptions, we are going to have duplication. Better
23 there should be some indication now from the panel
24 whether it's in favour of dealing with detail at Panel
25 2, or dealing with it at the planning cluster stage as

1 Mr. Watson says. Everyone should be playing by the
2 same rules.

3 MR. STARKMAN: Could someone just explain
4 to me what the difference is between 70/30 in Panel 2
5 and 30/70?

6 MR. RODGER: I don't want you to be under
7 the impression that I have to -- I can wait to a later
8 panel to deal with the reserve margins. I only ask if
9 I don't address it to Panel 2, and when I get to Panel
10 10 I am shut out from asking those questions, and the
11 Board said you should have asked all those in Panel 2.

12 So, I want to be clear that if it is
13 going to be -- if we agree that it is relevant in both
14 stages, I want to make sure that there is some
15 flexibility there, that it is agreed that it is
16 important enough at that later stage for you to cover
17 ground that you don't have to worry about now.

18 MR. STARKMAN: Yes, but just questions
19 about how reserve margin is presently calculated.
20 How the system performed in that reserve margin plan
21 analysis and so on, you will deal with in Panel 2.

22 When we come to Panel 10, you will say,
23 well, we think we need a reserve margin like this,
24 because we are looking at the sort of options, at least
25 all....

1 You need a reserve margin of what you
2 want to say 10 per cent of 40 per cent. That means
3 certain things flow from it.

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1 [9:30 a.m.] MR. RODGER: That is right.

2 MRS. FORMUSA: That is our understanding
3 of it. Thank you very much, Mr. Starkman.

4 MR. HARPUR: Laura, what you want to do
5 is bring to the Panel 2 panel, experts who are in a
6 position to deal with as much of a level of detail as
7 the parties want to get into. Most of your focus,
8 insofar as reserve margin is concerned, will be at
9 Panel 2.

10 MRS. FORMUSA: With respect to the
11 calculation of the reserve margin, what it is all about
12 is impacts on the existing system and how that system
13 will perform through the planning period. It is a key
14 factor in terms of what it is going to look like. It
15 is what we have got now, and it is how we determine our
16 requirements for the future.

17 How that reserve margin impacts on the
18 future mix of option, what the system will look like as
19 we start to add new Demand/Supply options to it and as
20 other features of the existing system begin to retire,
21 that is for later panels. That is a fair question --
22 those are fair questions.

23 MR. WATSON: If I could, Michael, let me
24 say that I agree with a lot of what Laura said. There
25 is no doubt that reserve margin is very important to

1 the existing system. And it is important that the
2 Panel understand early what a reserve margin is, how
3 these reserve margins compare to other utilites, what
4 are the levels of the current reserve margin, and those
5 were all things that Laura was indicating just a few
6 minutes ago. I agree with all of that.

7 Where I think we take issue is in the
8 last thing that she was mentioning. While it is
9 important to look at the reserve margin on the existing
10 system in Panel 2, when you are looking at the reserve
11 margin on the existing system over the planning stage,
12 that is where we have a little bit of difficulty.

13 It is important to understand that the
14 existing system today is not the same as the existing
15 system six months or a year from now, or five years
16 from now. Notes are being added, the conservation
17 measures are taking hold. All of these things are
18 significant, in a planning context, to look at what the
19 system will be. And in determining your least cost
20 solution, in coming up with your optimal plan, you put
21 all of these things into the mix, and you come up with
22 an appropriate reserve margin.

23 To reiterate the example I made about
24 Quebec Hydro, let's just change it to the NUG or demand
25 management scenario. If in fact, Hydro, if in fact,

1 the environmental groups and others are successful and
2 there are no new supply options in the plan, and
3 conservation and NUGs take care of all the new supply,
4 you are going to have a fundamentally different system.
5 You are going to have to have a different least cost
6 analysis, which is going to give a completely different
7 concept of reliability and reserve margin. And only
8 when you have the information from these later panels
9 can you appropriately deal with this whole concept.

10 Now again, I hasten to add, it is
11 important that you define it early, understand it, so
12 that when you are talking about these later panels,
13 when you are getting into reliability issue of NUGs and
14 reliability issue of the conservation programs, which
15 are going to be key issues, that you appropriately
16 understand it, and then, with that information, you can
17 apply it to the planning cluster, and at the end of the
18 day come up with a true least cost plan.

19 MR. HARPUR: What I propose to -- I am
20 sorry, Laura, did you want to speak to that?

21 MRS. FORMUSA: Maybe I could just add one
22 more point. I suspect we are not too far off. What we
23 would like to take out of Panel 2 is the methodology
24 with respect to determining a reserve margin. We don't
25 want to have to say, to continue on every time we look

1 at a particular option, be it demand or supply, or when
2 we put it all together and say, well, should you have
3 used LOLP, L-O-L-P, or should you have used the F&D
4 model, as we have used, or whatever.

5 We are talking about methodology. And
6 you can take that methodology for determining reserve
7 margin and apply it to different mixes or different
8 systems in the future, and what you might end up with
9 are different reserve margins. Those discussions in
10 the future are appropriate for the later panels. But
11 we'd like to take forward from Panel 2 an understanding
12 of what the methodology is that we have applied, and
13 what we have continued to apply in planning for the
14 future system.

15 MR. HARPUR: So when you say you want to
16 take out the methodology, do you mean you want to have
17 dealt with it?

18 MRS. FORMUSA: Yes.

19 MR. HARPUR: All right.

20 MRS. FORMUSA: I don't know if that
21 helps.

22 MR. HARPUR: Well, what I propose to do
23 during our recess and before the Panel comes in, is
24 simply acquaint them with the essence of the positions
25 that parties are taking about reserve margin. I'm not

1 going to try to argue any side of it. I'll leave it
2 for you to address them in the same fashion you have
3 me. At least I understand what is being argued about
4 at this stage.

5 Are there other issues which parties
6 regard as being insufficiently addressed by either the
7 statement of issues or the matters to be deferred list?

8 David?

9 MR. STARKMAN: I guess just on the
10 environmental health effect issue. I'm content with it
11 being put off to later panels, but my understanding,
12 and the way I have been putting it, is that these are
13 issues which can be raised with Panel 2. However, at
14 some point, you may be getting into a level of detail
15 which the Panel feels should be deferred to a later
16 panel. And I guess that that is how I'm approaching
17 most of the issues here.

18 I mean, I have a question, a question of,
19 say, performance of the nuclear stations. Now you can
20 ask questions about the performance, because that
21 impacts upon the system, but conceivably, as you delve
22 further into what are the -- what are the difficulties
23 that have been encountered with the performance, and as
24 you get into the specifics of those difficulties, they
25 may say, "Please, we will deal with that in panel No.

1 9."

2 And I guess that has been my approach.
3 You can ask questions about the environmental impacts
4 or emissions, supply options, and they might give you
5 an answer, and if you probe into the specifics, they
6 might suggest it be put off into a later one. I just
7 am conferring my understanding of how the matter would
8 be dealt with generally.

9 MR. HARPUR: Is that the way you see it
10 as well, Laura?

11 MRS. FORMUSA: Yes. Our witnesses will
12 be prepared to entertain those questions, and at some
13 point will say, "Well, that is really going beyond my
14 expertise, and panel X will be able to deal with your
15 detailed questions."

16 MR. HARPUR: May I just respond to that?
17 I see that process as working, so long as, when it gets
18 to the later panel, people remember the stage they
19 reached with the witnesses in Panel 2. Because if you
20 don't, and you decide that you want to refresh your
21 memory on the whole system, you will be starting again
22 with your first question and running through the first
23 20, 20 being the point at which you exhausted the
24 knowledge of the first individual you were talking to.

25 I think it is important that we not

1 duplicate, and make a note of the fact and perhaps
2 simply confirm to the Panel, when you get to Panel 6,
3 that, "We have already elicited the following testimony
4 through our questions of Panel 2."

5 MRS. FORMUSA: I don't think that will be
6 a problem.

7 MR. HARPUR: Mr. Hunter?

8 MR. HUNTER: The problem I have with that
9 is it is rather divisive, and in fact gets to a point
10 of divide and conquer.

11 I have one other problem. That is in
12 documentation supplied, and no interrogatories replied
13 to, in particular, to DSI 9101, the problem being that
14 there were several items that were thoroughly opened
15 up, interrogatories that I have asked in regards to
16 that that have not been replied to, and I'm having a
17 very difficult time discussing statement of concerns,
18 at a time when you don't know Ontario Hydro's position.

19 MR. HARPUR: Let me understand this.

20 There are questions which you asked about Witness Panel
21 2 which have not yet been answered?

22 MR. HUNTER: The extended Witness Panel 2
23 with document 9101. I think that is the number. I'm
24 going from recollection.

25 MR. HARPUR: You asked questions about

1 that, you haven't received an answer, and accordingly,
2 you don't feel in a position to advance all of your
3 concerns?

4 MR. HUNTER: Exactly. We don't know
5 Hydro's position. I had a very grave concern of giving
6 my statement of concern before Hydro had given an
7 answer that allows them to fit it right into my answer.
8 I have a real concern about this whole process of Panel
9 2.

10 MR. HARPUR: Thank you. I have made a
11 note.

12 Ms. Marlatt?

13 MRS. FORMUSA: Can I address that, for
14 the record?

15 MR. HARPUR: Yes.

16 MRS. FORMUSA: First of all, the document
17 that I believe is being referred to, Mr. Hunter
18 preferred to as 9101, is our Exhibit 87. It was filed
19 recently, and we are entertaining and responding to
20 interrogatories that arise from that document. That is
21 the one, Michael, that talks about the review of the
22 liability criteria.

23

24

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...

1 We received Mr. Hunter's questions on
2 April 16th, there are three of them. My understanding
3 is that answers will be ready probably this week.

4 There are other parties who have
5 outstanding interrogatories to which we have not
6 responded yet. They have provided us with their
7 statements of concerns. And I frankly don't understand
8 what Mr. Hunter's problem is.

9 As far as the first issue he raised with
10 respect to divide and conquer, I take strong objection
11 to that characterization of the way in which Panel 2
12 and the later option panels are proceeding. As I
13 explained to you and the others, we can either do this
14 case all in one panel, which would involve bringing in
15 all the option issues, because the existing system is
16 composed of the various technologies and demand options
17 that there are, or we can deal with it in a fashion
18 that we have chosen.

19 We said it once, we will say it many
20 times, planning is integrated in this Demand/Supply
21 Plan. It's iterative. There are many issues that are
22 related and we will have to come back to. It is not
23 divide and conquer. I want to make that perfectly
24 clear.

25 MR. HARPUR: Mr. Hunter, let me point out

1 that at the risk of appearing to cop out, I am not the
2 arbitrator on this issue. It may be that I will be
3 acquainting the panel before they come in with the
4 kinds of issues they can anticipate facing this
5 morning, but if you intend to speak to this matter
6 before the panel, it might be wisest to save your
7 arguments for that stage.

8 MR. HUNTER: I will make this very
9 simple. The statement was just made to know where it
10 was cut off, to know where it starts. That is not
11 allowing to go back to get the essence to bring it
12 forward.

13 MR. HARPUR: I'm sorry, I don't
14 understand you.

15 MR. HUNTER: If you say the argument is
16 brought from one point to another point and you have to
17 remember where the cut-off point is, that is where you
18 are to start later on, then you are not allowing the
19 flow. That's the position.

20 MR. HARPUR: Ms. Marlatt?

21 MS. MARLATT: Yes. My concern isn't so
22 much with the division. I am concerned that Hydro put
23 it on the record before the Board that they recognize
24 that they will have to be flexible in that separation,
25 because, for example, I don't think it's useful for us

1 to bring all of our experts to Panel 2, stand up and
2 ask all of our questions and have the panel say, we
3 can't answer that.

4 I think it makes more sense for us to try
5 to make an estimate of later panels, go on that
6 estimate and, if there is a problem at that point, we
7 expect that Hydro would understand that it has to be
8 flexible in making those determinations. Because it's
9 really a waste of time for us to stand up and ask all
10 of our cross-examination, bring out all of our
11 witnesses for Panel 2, and be deferred on specific
12 issues until later.

13 MR. HARPUR: You are saying, then, you
14 would defer virtually all of your cross-examination to
15 the later panel?

16 MS. MARLATT: Most of our
17 cross-examination is likely to deal with the more
18 detailed -- will deal with more detailed questions and
19 will be deferred to later panels, but, for example, the
20 State of the Environment Report in itself contains some
21 relatively detailed questions. So, although there is a
22 witness on Panel 2 who may be dealing with those
23 questions, we could also find out that those more
24 detailed questions are being deferred.

25 So, I don't want to have to bring in all

1 of our witnesses for that and then get sent off to
2 another panel. I am satisfied to deal with it in a
3 later panel, as long as we don't end up in a situation
4 where, at that point, we are shut out.

5 MR. HUNTER: Just one panel.

6 MRS. FORMUSA: I think you would like to
7 to address that.

8 MS. MARLATT: Well, I would just like to
9 raise it before the Board that you recognize for
10 parties such as ours, we can't keep bringing in all our
11 witnesses.

12 MRS. FORMUSA: I will address that.

13 MR. HARPUR: Constance, when you say you
14 don't want to keep bringing your witnesses in, do you
15 mean your experts to brief you in respect of
16 cross-examination?

17 MS. MARLATT: Yes. We want to bring in
18 experts for cross-examination, when we are
19 cross-examining Hydro's witnesses. I would like to
20 know that I could bring them in on the later panels and
21 I don't have to have them here to review the evidence
22 of Panel 2.

23 MR. HARPUR: Thank you.

24 Other points?

25 MR. CASTRILLI: Mike, I will stand up so

1 you can see me and hear me at the same time.

2 MR. HARPUR: Thank you.

3 MR. CASTRILLI: I just have a question of
4 clarification from Laura. We had a brief discussion
5 last week and my understanding at the time, with
6 respect to NAN, was that question No. 2 from our
7 statements of concerns was being deferred, in part, to
8 Panel 7. I see on page 8 of the larger document Laura
9 has handed out this morning, that only items A and B of
10 question 2 have been deferred in part to Panel 7.

11 I am just wondering if Laura can clarify
12 for me what, therefore, is the status of questions or
13 points to 2C through 2H under NAN; are they being dealt
14 with in Panel 2, or can I also take it they will, in
15 part, be deferred to Panel 7?

16 MR. HARPUR: I understood those would be
17 dealt with in Panel 2.

18 MRS. FORMUSA: If you just give me a
19 second.

20 MR. CASTRILLI: Sorry.

21 MRS. FORMUSA: I'm sorry, I think you
22 have caught us on a mistake. We intended to include
23 paragraphs A through to H.

24 MR. CASTRILLI: You did. Fine.

25 MRS. FORMUSA: I'm sorry. Thank you. We

1 will correct that on the next draft. I guess the
2 typist didn't turn over to the next page. We will
3 include it right through to H.

4 MR. HARPUR: Thank you.

5 Other concerns?

6 MR. MONDROW: I think the point has been
7 alluded to, I would just clarify it, that the question
8 of Panel 2 versus deferral to other panels should --
9 that understanding, rather, should apply to issues
10 beyond just the environmental issues and the reserve
11 margin issues. I think that's the understanding but I
12 think it should be made clear. For instance, issues
13 revolving around nuclear facilities, issues revolving
14 around retrofitting, et cetera.

15 MR. HARPUR: Just let me understand you.
16 You anticipate that these are going to be done in the
17 same fashion as are environmental performance and the
18 reserve margin?

19 MR. MONDROW: Yes. That is, that the
20 understanding is that, while questions are appropriate
21 on those issues for the Panel 2, and to the extent that
22 the questions get very detailed and
23 technology-specific, they are appropriately deferred to
24 later panels, and they will be entertained by later
25 panels.

1 MR. HARPUR: I have tended to hive off
2 the reserve margin and environmental performance on the
3 theory that the other matters that one sees in the
4 issues list for Panel 2 were ones on which Hydro's
5 witnesses could provide a significant level of detail.
6 Should we be assuming that it is the same throughout?

7 MRS. FORMUSA: Again, it goes back to my
8 points that, when you are talking about the existing
9 system, you're basically talking about a mix of options
10 and technologies that we will be talking about in the
11 later panels.

12 It is important for the Board to
13 understand what the existing system is composed of. To
14 get into the nuts and bolts of the system and of the
15 nuclear option of demand management measures that might
16 be undertaken, that's not the purpose of this panel.
17 Those would be all dealt with on the later
18 option-specific panels.

19 But it is important for them to have an
20 understanding of what is there now, what that mix of
21 options can contribute to the future planning. And to
22 a large extent, even our experience with those options,
23 be it technical, cost, or environmentally social, any
24 details with respect to that would have to be dealt
25 with with the experts on the option panels.

1 I think if you look at it from the
2 perspective of the entire system that we are looking
3 at, rather than trying to pick it all apart in this
4 panel, that's perhaps the easiest way to define the
5 line between Panel 2 and the subsequent panels.

6 MR. HARPUR: Thank you.

7 Other matters?

8 Would you identify yourself?

9 MS. PURDY: Sheila Purdy, and I repeat,
10 the Sierra Club and Cultural Survival.

11 On the environmental performance
12 question, the real difficulty that we have with that is
13 that Panel 2, at least according to the original
14 statement of witnesses, will be quite specific on, for
15 example, flooding and mercury, which we consider a
16 fairly detailed point of evidence. I think the
17 difficulty is making the judgment call, when we will
18 only know, as an intervenor, the extent to which
19 Hydro's witnesses will go into detail once they are on
20 the stand. And at that point, if we have made the
21 judgment call to defer our cross-examination to a later
22 panel, we may be caught short. We may not be prepared
23 since we may have a different opinion as to what level
24 of detail will be gone into.

25 MR. HARPUR: But if the general

1 expectation established today is that you will be
2 entitled to go into a significant level of detail at
3 the later panel stage, surely no objection could be
4 taken to a detailed cross-examination question by Hydro
5 at that stage.

6 MS. PURDY: No. Then, I guess, the
7 response is that what we would prefer is a very clear
8 statement by Hydro that we will not be foreclosed from
9 examining, in detail, any aspects of environmental
10 performance of the existing system, and if that is
11 agreeable, then we would have no objection.

12 MRS. FORMUSA: I think in response to
13 both Constance and Sheila and all the others, it's fair
14 to say that the details will be dealt with in later
15 panels. They are listed that way in the witness
16 statement for the purpose of identifying... And
17 certainly, our witness will be speaking to the
18 characteristics of the existing system with respect to
19 the environment.

20 The existing system has certain features
21 that affect the environment. Acid gas comes from
22 fossil-fuel facilities, flooding and mercury are
23 associated with hydraulic facilities. We are going to
24 have to speak not to just what -- the fact that it is a
25 nuclear facility or a hydraulic facility, but that

1 there are other aspects to it: There are cost aspects
2 to it; there are cost aspects to it. Cost aspects to
3 it, technical and environmental, but we don't propose
4 to get into these details in Panel 2. It is important
5 to understand that the system isn't operating in a
6 vacuum, that it is [coughing] the environment and has
7 these impacts.

8 But certainly, if you look at the witness
9 that will be speaking to this, Judy Ryan, she does not
10 have expertise in each and every one of these areas,
11 and I think you can take the guidance from that.

12 Later panels can also speak to some of
13 the data in the State of the Environment Report, as
14 well, in terms of how those emissions are derived.

15 So I think it's probably just as
16 favourable to the intervenors, in terms of
17 understanding that there will be this later
18 opportunity. It is more of an opportunity, rather than
19 a restriction, being placed on Panel 2, if I can
20 characterize it that way.

21 MR. HARPUR: Are there additional
22 questions about what we have in front of us?

23 If there are not, what I propose to do is
24 recess for 15 minutes and, in that space of time,
25 Laura, perhaps you could try to speak to those parties

1 to whom you haven't yet spoken, and then we can
2 reconvene at about 10:10, see what has established and
3 then I can ask the panel to come in.

4 MRS. FORMUSA: That is fine.

5 MR. HARPUR: Thank you. 10:10.

6 ---Recess at 9:55 a.m.

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1 ---On resuming at 10:20 a.m.

2 MR. HARPUR: I would like to start again
3 if we can. I think this will just take a moment.

4 What I understand from my discussions
5 with Laura since our break is that, although Energy
6 Probe, NAPA, and OMAA are not yet here and haven't yet
7 spoken to Laura, Northwatch, Solar Energy, and
8 Northumberland Environmental Protection have all spoken
9 to Hydro and are content with the state of affairs. Is
10 that correct?

11 FROM THE FLOOR: Correct.

12 MR. HARPUR: One matter that I just
13 wanted to clarify before going back in to speak with
14 the panel has to do with this business of deferring a
15 part of questions to a later panel and retaining a part
16 here. The panel is curious as to whether, if one puts
17 together those two parts, one will have a complete
18 answer. Can you help me with that? I think their
19 concern is that something might be missed out.

20 MRS. FORMUSA: Falling between the
21 cracks?

22 MR. HARPUR: Yes. If we have covered the
23 general, and then we get to the specific in a later
24 panel, will we have dealt with it all? There isn't
25 some part that's missing somewhere?

1 MRS. FORMUSA: I can't think of anything.
2 Constance raised the question of evaluation and
3 comparison, and some of you will note that the option
4 panels being 6, 8, and 9, that's an omission of 7, in
5 some cases we have included Panel 10. It depends on
6 how we read your statement of concern.

7 Panel 10 is intended to deal with the
8 evaluation of comparison where you put all the options
9 together and trade-offs that you might make at that
10 point. I haven't put Panel 10 on yours for that
11 purpose. You are not precluded from raising it in
12 panel 10. It's just that statement of concern wasn't
13 necessarily read that way and, obviously, in later
14 scoping sessions, that would be addressed.

15 That's the break-down. The options are
16 in 6, 8, and 9; the evaluation and comparison of the
17 major supply options in 10; Demand/Supply Plans in 11;
18 we bring in the demand options and the supply options;
19 that's Panel 11.

20 MR. HARPUR: Although they aren't here, I
21 understand that some few of Energy Probe, NAPA and OMAA
22 have expressed concerns to you. Could you, in a
23 nutshell, let me know what those are now.

24 MS. HARVIE: Certainly I will speak to
25 that. I had a discussion last week with Brad Allison,

1 counsel for OMAA, and he raised the question as to
2 whether or not, in their statement of concerns -- looks
3 like question 2, it is on the last page, fourth
4 paragraph down, "Given the government grants and
5 subsidies --

6 MR. HARPUR: Can you give me a moment?

7 MS. HARVIE: Yes.

8 MR. HARPUR: Sorry, second page...?

9 MS. HARVIE: Yes, second page of OMAA's
10 statement of concerns, fourth paragraph down from the
11 top.

12 MR. HARPUR: Yes.

13 MS. HARVIE: "Given government grants and
14 subsidies, why are Ontario Hydro's prices somewhat
15 higher than the Canadian average?"

16 MR. HARPUR: Yes.

17 MS. HARVIE: A few wanted confirmation
18 that this will be dealt with in Panel 2. I was unable
19 to contact them to advise that, in fact, it will be
20 dealt with in Panel 2.

21 MR. HARPUR: Thank you. Was there anyone
22 else who had spoken to you and raised a concern from
23 that group, NAPA or Energy Probe?

24 MRS. FORMUSA: No.

25 MR. HARPUR: All right. Well, if there

1 are no other items that you want to address in advance
2 of the panel coming in, I would like to break once
3 again, this time for about 15 minutes, and that would
4 take us to twenty to eleven and we will reconvene with
5 the panel. Thank you.

6 ---Recess at 10:35 a.m.

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1 ---On commencing at 10:50 a.m.

2 THE CHAIRMAN: Please be seated.

3 Now as best as we can understand it from
4 a brief briefing from Mr. Harpur, most of the issues
5 with respect to the scoping of Panel 2 have been
6 apparently resolved. There are a number of matters
7 that I think people wish to address, and then we will
8 see where we get to from there.

9 The basic documents that I am working
10 from is a document entitled "Panel 2, Existing System
11 and Requirements for Demand/Supply Option Statement of
12 Proposed Issues Prepared On Behalf of Ontario Hydro."
13 It is a three-page document with seven items in it.
14 And a memo titled "Matters to be Addressed in Later
15 Ontario Hydro Panels, But Included in Parties Panel 2
16 Statements of Concerns." It is a 22-page document, in
17 which the various parties and their questions are
18 listed, and some of those matters are deferred to other
19 panels. Those documents were a revision of earlier
20 documents submitted by Ontario Hydro, and came in to us
21 this morning.

22 The first matter that I have is that
23 there has been some issue of concern by the parties
24 with respect to the reserve margin, which Hydro
25 proposes to deal with in Panel No. 2, even though there

1 are still matters of subsequent panels that may impinge
2 on that. And I think, Mr. Watson, is that your matter?

3 MR. WATSON: Yes. Would you like me to
4 speak to that now?

5 THE CHAIRMAN: Well, if it is convenient,
6 yes, that would be.... You don't have to, if you
7 don't....

8 MR. WATSON: I would welcome the
9 opportunity, sir.

10 THE CHAIRMAN: Yes, Mr. Watson.

11 SUBMISSION BY MR. WATSON:

12 Let me say at the outset that you are
13 quite right in identifying the issue of the reserve
14 margin. However, in fairness to Hydro, the MEA agrees
15 that reserve margin is a very relevant and important
16 issue to discuss in the context of the existing system.

17 Further, in fairness to the MEA, I am
18 sure Hydro counsel will also tell you that they feel
19 reserve margin is also an issue to be discussed later
20 in what I will call the planning clusters - the
21 planning cluster, that is, Panels 10 and 11 - later in
22 the day.

23 The difficulty between the MEA and Hydro
24 focuses in on the amount of emphasis to be placed on
25 the reserve margin discussion. Hydro feels that the

1 thrust of its reserve margin case should be presented
2 in Panel 2, and the MEA, while it feels this is
3 important to Panel 2, feels that the most significant
4 aspects of it should be dealt with in the later panels,
5 10 and 11.

6 In discussing this in the prescoping
7 exercise, and in conversations with Hydro counsel, I
8 picked figures of 30 and 70 dealing with the per cent
9 of the focus, and we simply are at different points of
10 view with respect to that. We feel it should be a
11 30/70 type of situation. In fairness to Hydro, they
12 feel it is more like a 70/30. There is no magic in
13 those numbers, just simply to try and convey the issue.

14 Now this issue doesn't exist in a vacuum.
15 There is some help in understanding it by looking at
16 some of the other issues associated with Panel 2. For
17 instance, the issue of transmission, the global issue
18 of rehabilitation: All of those issues are being dealt
19 with in a general fashion in Panel 2, and the details
20 have been reserved for later panels. The MEA's
21 position is that reserve margin should be dealt with in
22 the same way.

23 Now if I could refer you just briefly to
24 the actual DSP plan report on page 4.19, that gives you
25 a very succinct statement of the MEA's position. About

1 two-thirds of the way down the page there is a sentence
2 that says:

3 "Planning,"

4 - and I emphasize that word -

5 "Planning seeks to minimize the
6 customer total cost by seeking an optimum
7 unit cost and appropriate system reserve
8 margin."

9 In effect, the link between reserve
10 margin and planning is evident and is acknowledged by
11 Hydro and is the essence of the MEA's position.

12 In effect, what you are dealing with is a
13 reliability situation. And while exploring reliability
14 is very key to the existing system, it is also of
15 fundamental importance to your system planning
16 parameters. You need to look at things like loss of
17 service, forced outages, the characteristics of the
18 load in future. Very key to that issue are things such
19 as the mix of NUGs, conservation, load shedding,
20 programs such as that.

21 You have to look at the supply mix. Not
22 only as it relates to the existing system, but also
23 dealing with the major new supply options, the NUGs and
24 the matters that I have just mentioned. Also, of
25 course, what is significant is to look at things like

1 rehabilitation, redevelopment, life extension. You
2 have to explore all of those, as well.

3 Very simply, you need all of this
4 information from the later panels. You need to
5 incorporate all of this information into your planning
6 cluster, so that you can truly optimize the system, and
7 from there, obtain the appropriate reserve margin.
8 That is the philosophy that the MEA espouses in this
9 situation.

10 What you want to ensure is that you do
11 not design the system for the reserve margin. You want
12 to ensure that you obtain the inputs from the panels,
13 use this info to explore all the issues, assign a cost,
14 achieve a true least-cost planning exercise, and then,
15 at the end of the day, arrive with your reserve margin.

16 The reason you want to do it in this
17 fashion is because if you do not, in effect, what you
18 are starting with is a preconception of what the mix
19 will be. I can give you a very simple example of that.

20 The current Hydro reserve margin, the one
21 mentioned in the plan, is approximately a 24-per cent
22 reserve margin, and that is a function of the mix that
23 is conceived, that is perceived for the future.

24 If you look at figure 4.16 in the plan
25 report, you will see a list of the various reserve

1 margins for other utilities. A good example is the
2 Hydro Quebec reserve margin. That is ten per cent, a
3 significant difference from the Hydro system. And the
4 reason for that is because of their high dependence on
5 hydraulic power, which is so reliable. It is very key
6 to know the mix, to know the system, optimize it and
7 then choose the reserve margin.

8 In effect, what this boils down to,
9 practically, is that in looking at the witness
10 statement for Panel 2, we notice that we had Mr.
11 Snelson and Mr. Taborek on for Panel 2. I understand
12 from my discussions with Hydro that, in effect, Mr.
13 Snelson is the key player in dealing with reserve
14 margins. And in fact, when you look at his title, it
15 makes sense.

16 THE CHAIRMAN: Mrs. Formusa is shaking
17 her head vigorously.

18 MR. WATSON: I am sorry, Mr. Taborek;
19 that is my slip. It is Mr. Taborek, and Mr. Snelson
20 quite candidly admitted that to me. When you look at
21 Mr. Taborek's title, you will see that he is the
22 Section Head, Demand/Supply Integration Department,
23 System Planning Division. It seems clear that this is
24 the person you want to be discussing these issues in
25 the planning cluster later in the day. And perhaps a

1 practical solution to this is, in fact, to bring Mr.
2 Taborek in on Panel 10.

3 THE CHAIRMAN: On Panel 10?

4 MR. WATSON: Yes, Panel 10 and 11, later
5 in the day.

6 So that, in going through the exercise
7 that I have described to you, then, in effect, we have
8 the appropriate expert, who can deal with these issues
9 in the planning context, as Hydro relates them to
10 reserve margin, as the MEA suggests it should be.

11 Subject to any questions...

12 THE CHAIRMAN: So what you are really
13 saying is that the reliability factor - I'm boiling it
14 down, probably making it too simple - will very much
15 depend on the mix of sources.

16 MR. WATSON: That is...

17 THE CHAIRMAN: Now what are you asking us
18 to do? What would you like done as a result of that?

19 MR. WATSON: Well, first of all, I would
20 like you to recognize that there is this significant
21 concern that has to be dealt with in the later panels.
22 And I would suggest that the way this should be dealt
23 with is the same way that we are dealing with all of
24 the other issues in Panel 2, such as the environmental
25 issues, the transmission issues, the rehabilitation

1 issues. All of these issues are being dealt with, in
2 effect, in a general definition sort of way in Panel 2,
3 with the detail and the specific applications deferred
4 to the later panels.

5 Now, as I have indicated, and you have so
6 succinctly summarized, you have to know not only what
7 the mix of supply options is -- let's assume there are
8 no supply options. Let's assume that all new
9 generation will be met by conservation programs, NUGS.
10 Those bring in factors such as reliability,
11 dispatchability, transmission problems.. I would
12 suggest to you that those have to be explored in the
13 later panels, before we are confident enough to take
14 this information and put it in the planning cluster and
15 deal with it at that time.

16 We optimize the system there, we come up
17 with a least cost, which is, I would suggest to you,
18 the purpose of this whole exercise. It is the least
19 cost planning exercise. And at the end of the day,
20 when we have this least cost planning exercise
21 finalized, we then incorporate the appropriate reserve
22 mix, reserve margin, based on whatever the plan is at
23 that time. I'm not sure we can do that today and in
24 this panel.

25 THE CHAIRMAN: Thank you, Mr. Watson.

1 Does anyone else besides Mrs. Formusa
2 want to speak on this issue? Mr. Rodger?

3 MR. RODGER: Just to note that AMPCO has
4 the identical concerns that Mr. Watson has raised.

5 THE CHAIRMAN: Thank you.

6 Mr. Starkman?

7 SUBMISSION BY MR. STARKMAN:

8 Mr. Chairman, I'd just say that I think
9 it is appropriate to explore in Panel 2 the methodology
10 for arriving at how Hydro gets its reserve margin, and
11 the other issues that are associated with that, and
12 then we recognize that it also comes into play later
13 on. And from my discussions, I don't think Hydro takes
14 issue with that, and so it falls to be -- the
15 methodology falls to be addressed in Panel 2. And then
16 the implications for -- or the choosing of a reserve
17 margin falls to be dealt with in later panels discussed
18 in the options.

19 THE CHAIRMAN: Thank you.

20 Mrs. Formusa?

21 SUBMISSION BY MRS. FORMUSA:

22 Once again, I'm going to say that the way
23 Mr. Starkman has put it is very much, in a nutshell,
24 the way I would like to put this issue before you.

25 In order to understand the way in which

1 the reserve margin is looked at in the Demand/Supply
2 Plan, I think you have to understand the way in which
3 we have treated Panel 2. We have gone around with the
4 parties and with board counsel. The purpose of Panel 2
5 is simply to give you a description of the existing
6 system, to give you an overview of what is there, but
7 nothing more.

8 And I want to emphasize, as I did
9 earlier, that it is more than that. That when we leave
10 that panel, what comes out the spout, as we often say
11 when we are look at Chapter 5, is what have you got
12 now?

13 We have heard in Panel 1 what future
14 loads are going to be, or what we think, what we
15 predict, those loads will be; what our requirement in
16 that end will be. What we need to know how is what do
17 you have? Are you starting with nothing, or do you
18 have something already there that will be used to meet
19 those predicted loads?

20 And we say, well, yes, we do. We have an
21 existing system, and it is able to do a number of
22 things. It is operated in a certain way, and it can
23 provide a certain number of megawatts today. But it
24 has certain characteristics that will change over the
25 time period. Things will retire, other things may

1 break down, and, at the end of the day, what comes out
2 the spout is the load-meeting capability of that system
3 over the planning period.

4 Now, in order to look at load-meeting
5 capability, you have to know what the reserve margin
6 is. They are both linked, and it is a system issue.
7 It is not an issue that is tied, as are the
8 environmental costs and technical characteristics --
9 those issues are tied to the options in many ways, and
10 that is why you see the breakdown between Panel 2 and
11 the later panels. But the reserve margin is a system
12 issue.

13 THE CHAIRMAN: But you will agree with
14 Mr. Rogers to this extent that the reserve margin
15 depends to a certain extent, at least, on the source of
16 the energy?

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1 [11:05 a.m.] MRS. FORMUSA: It depends, I will say
2 that it depends - and I think he said this - on the mix
3 of options that you have in your system. So, to the
4 extent that we have a certain mix of options on the
5 existing system, a particular reserve margin will be
6 appropriate for that.

7 As that system changes and as new options
8 are added to it and other options are retired from it,
9 that system mix changes, and it may be appropriate to
10 argue for a different reserve margin, and that's where
11 it comes back in the later panels.

12 So I think we agree in principle. It's
13 really a question of degree: Is it 70 per cent in
14 Panel 2 or and 30 per cent in Panel 10, as we are
15 suggesting, because methodology does get into a fair
16 amount of detail with respect to the reserve margin, or
17 is it the opposite way? Do we just say there is a
18 reserve margin; it's 24 per cent; we will get into the
19 nuts and bolts of it later.

20 If I might just take a moment to explain
21 why we have done it the way we have. It has always
22 been clear from our witness statements that Mr. Taborek
23 and Mr. Snelson would be dealing with this issue,
24 although not specifically. Chapter 3 of the plan
25 analysis which deals with reliability is one of the

1 specific references for that panel. Chapter 4 also
2 speaks to the reserve margin. And more recently, we
3 have filed a report --

4 MS. PATTERSON: Mrs. Formusa, they can't
5 hear you at the back.

6 ---Off the record discussion.

7 MRS. FORMUSA: I guess I left off
8 speaking about the references that were in the witness
9 statement with respect to the way in which we were
10 allocating this issue.

11 Mr. Watson quite correctly points out
12 that it's dealt with in Panel 2, and we make specific
13 references to Chapter 3 in the plan analysis.

14 We have recently added Exhibit 87 which
15 is the review of generation reliability planning
16 criteria, which is a recent review that was undertaken
17 to review reliability and reserve margins. But then,
18 when one looks to Panel 10, one sees that the various
19 cases that were developed, they are then looked at
20 against a number of criteria and one of them is the
21 reserve margin: What is the appropriate reserve margin
22 for the mix of options in the plan put forward to you
23 at the end of the day.

24 In our view, and the reason why we made
25 those allocations in these panels, it is important to

1 establish at the beginning what the methodology is in
2 arriving at that reserve margin, and understanding it
3 from a system perspective in order to proceed to that
4 later panel.

5 How will we know what our requirement is
6 at the end of Panel 2, and how will we know how much
7 and how many options we will need to fill that
8 requirement if we don't know the size of that
9 requirement? In fact, that's going to be a key issue
10 for some intervenors with respect to Panel 2. If some
11 feel that you can get more out of the existing system,
12 or less, that it is going to be less reliable, then
13 that's certainly something that we need to know before
14 we move on to later panels.

15 THE CHAIRMAN: I am having some
16 difficulty in really seeing that the differences
17 between you and Mr. Watson are anything other than just
18 a matter of degree, and it is very hard to be specific
19 about how that degree can be defined.

20 MRS. FORMUSA: I think what we are saying
21 is that we are prepared to speak in our
22 evidence-in-chief to the details of Chapter 3 in the
23 plan analysis and to Exhibit 87 in terms of the
24 methodology that Ontario Hydro employs for the
25 determination of reserve margin, and that Mr. Watson

1 and the other intervenors should be prepared to
2 cross-examine Mr. Taborek on those issues for this
3 panel.

4 To the extent that we need to revisit the
5 appropriateness of reserve levels in later panels,
6 then, obviously, our witnesses will speak to that. But
7 we did not intend to get back into the details of the
8 methodology that we employ to determine reserve margin.
9 Mr. Taborek is not on Panel 10 for that purpose.

10 THE CHAIRMAN: But it may turn out, for
11 reasons that none of us can anticipate, that it might
12 be appropriate for him to be there.

13 MRS. FORMUSA: In that case, I think that
14 the best procedure would be to determine it as we get
15 closer to the scoping for Panel 10.

16 But right now, I wanted to make it
17 absolutely clear that Mr. Taborek in his
18 evidence-in-chief was going to speak to the details of
19 those materials in Panel 2, and we will be prepared to
20 entertain cross-examination from the parties on those
21 two documents that I have referred to.

22 THE CHAIRMAN: On one side, we want - if
23 you are right and there should be a full exploration of
24 methodology of this factor - we want to avoid people
25 saying in Panel 9, well, that was a question you should

1 have asked in Panel 2. I don't want to have those kind
2 of arguments, that's the only thing that I think we
3 want to try and not have.

4 MRS. FORMUSA: Yes. And I think in
5 fairness to all concerned, that this is the only issue
6 where I think the argument might arise. On all the
7 others, we are prepared to be relatively flexible in
8 terms of getting into the details later on, with
9 respect to the options, from their cost and
10 environmental characteristics. And it's this one where
11 we are saying --

12 THE CHAIRMAN: But I can see, as the
13 Hydro evidence unfolds, that there could be a
14 possibility that somebody might say, well, that's a
15 question I might have; if I had known about that, I
16 might have asked it back in Panel 2. That kind of
17 thing.

18 MRS. FORMUSA: In that case, I think it
19 is appropriate at that time for us to all say, well,
20 yes, it may be necessary for us to bring back Mr.
21 Taborek or Mr. or Ms. X at some point in time.

22 But at this point, I just didn't want
23 there to be any surprise that Mr. Taborek was going to
24 be dealing with the details of the methodology, and I
25 want to make that absolutely clear, that he will be on

1 this panel. Whether he needs to be brought back, I
2 agree, that can be left for a later time.

3 THE CHAIRMAN: Thank you.

4 Mr. Watson?

5 MRS. FORMUSA: Mr. Snelson just wanted me
6 to make it absolutely clear that the later panel will
7 deal with the application of the methodology, which
8 could lead to a different reserve margin. Again, that
9 goes to the mix of options.

10 THE CHAIRMAN: I think everyone
11 recognizes that possibility.

12 Mr. Hunter, you have something on this
13 particular matter?

14 MR. HUNTER: Yes, sir.

15 THE CHAIRMAN: I asked a few moments ago
16 if anyone wants to say anything before I called on Mrs.
17 Formusa.

18 MR. HUNTER: Sir, I stood up, she was
19 right between us.

20 THE CHAIRMAN: All right.

21 SUBMISSION BY MR. HUNTER:

22 I apologize, I could not get your
23 attention.

24 We are being asked, or you are being
25 asked, to make a decision on scoping, when the evidence

1 that is going to be presented is on a document which we
2 haven't even received the responses to the
3 interrogatories to, nor had a chance to look at the
4 implications of those responses.

5 THE CHAIRMAN: Is this the reserve margin
6 you are talking about?

7 MR. HUNTER: Yes, it comes back to
8 reserve margin that's mentioned in that document, and
9 the methodology of how they arrive at it. So, I am
10 having some real problems here of how we go about
11 scoping, how we go about saying what our concerns are,
12 when, in fact, we haven't even got the replies to our
13 interrogatories yet.

14 THE CHAIRMAN: Okay. Thank you.

15 You have heard what he has said, he says
16 he has given you an interrogatory on this issue and he
17 hasn't had a reply yet.

18 REPLY BY MRS. FORMUSA:

19 Yes, I believe it was in March, probably
20 March 18th, that we filed the Exhibit 87, what is now
21 Exhibit 87, with respect to a review of the reliability
22 criteria, and, in accordance with our other filings,
23 updates, later reports, we have allowed, for a period
24 of about three weeks, for intervenors to get their
25 interrogatories in to us. And we have been responding

1 in about a three-week turnaround, three to four weeks.

2 We received Mr. Hunter's three
3 interrogatories with respect to that exhibit on April
4 16th, and I am almost certain that the answers are
5 going out this week. None of the other intervenors who
6 have put interrogatories in to us have raised this
7 concern.

8 Chapter 3 of the plan analysis does deal
9 with the methodology. This is not a new matter. The
10 Exhibit, Exhibit 87, is a review of that methodology.
11 So, I don't know what more I can add to that.

12 We will get the answers out this week, as
13 I have said, and certainly with respect to the others,
14 we are working on their answers as well.

15 THE CHAIRMAN: Thank you.

16 Mr. Watson?

17 FURTHER SUBMISSION BY MR. WATSON:

18 Just briefly, in reply, Mr. Chairman, the
19 issue of methodology. Methodology in this context
20 deals again with cost, and costing is a later panel.
21 Costing is so key to dealing with NUGs, conservation
22 programs, dealing with how the whole issue of avoided
23 costs feeds back through the later panels. Only by, in
24 effect, knowing some the later answers can we really
25 know the costing issues, can we then apply to it to the

1 methodology.

2 In effect, I am advised by our experts
3 that we cannot deal with the methodology in totality in
4 Panel 2. We can deal with some of the issues and we
5 will attempt to do that, and, of course, subject to
6 your decision, we will do what we have to do. But I am
7 advised by my experts that this is properly in a
8 planning focus, this is where it has to be dealt with.

9 I have nothing further to say on that.

10 One unrelated point: There were a number
11 of matters, or a few matters, discussed with Hydro
12 counsel on some of the other issues this morning with
13 respect to our statement of concerns in the scoping
14 package, they appear not to be in issue; however, I
15 will have to obtain instructions from my client before
16 we can actually approve the scoping package.

17 Thank you.

18 THE CHAIRMAN: Thank you.

19 ---Off the record discussion.

20 RULING:

21 We have discussed this and we think that
22 perhaps the best way to do it is to do it as Hydro
23 proposes, that they can put their evidence in as they
24 see fit in Panel 2. It will remain to be seen the
25 extent to which there will have to be some revisiting

1 of this issue in later panels as the evidence develops,
2 but at the moment we will not restrict the level of
3 detail which Hydro wishes to put in in Panel 2 on the
4 question of reserve margin.

5 Now, that, I think, was the main issue we
6 were told by Mr. Harpur. There may be other people
7 that have matters they want to talk about on Panel 2
8 scoping? Is there anybody with anything else?

9 Yes, sir.

10 MR. ADAMS: My Name is Tom Adams, I
11 appear on behalf of Energy Probe. Unfortunately,
12 counsel couldn't be here today. Just two matters I
13 wanted to mention, and the first is, I missed the
14 morning's submissions, but --

15 THE CHAIRMAN: Have you had a chance to
16 speak in advance with Mrs. Formusa?

17 MR. ADAMS: Very briefly, and I just want
18 to establish, I believe, what we have as an arrangement
19 on the record--

20 THE CHAIRMAN: All right.

21 SUBMISSION BY MR. ADAMS:

22 --that was that we have a number of
23 questions relating to the specifics of the generating
24 operations that are quite relevant to the existing
25 system capability. Hydro wants to defer them to later

1 panels, and we just want to establish our right to ask
2 questions regarding system capability once we have had
3 a discussion about specific options.

4 So, for example, on nuclear capability,
5 it will affect the ability of the existing system to
6 meet future loads, and we may have questions related to
7 system capability after having discussion on nuclear
8 performance. I believe Mrs. Formusa and I have a
9 meeting of minds on that question.

10 MRS. FORMUSA: That's correct.

11 MR. ADAMS: The second matter I wanted to
12 bring to your attention is regarding environmental
13 performance. Energy Probe, in its statement of
14 concerns, established a number of questions on
15 environmental performance. We asked a number of
16 interrogatories directed at Panel 2 on environmental
17 performance, following on Hydro's own outline of the
18 issues to be presented by this panel.

19 We are in strong support of the
20 Coalition's position that Hydro isn't bringing forward
21 witnesses that are going to be able to assist us very
22 much in this discussion. So it is, I guess, our view
23 that there is some constraint on the level of
24 discussion that we can have on these environmental
25 matters when Hydro itself has brought forward

1 environmental performance as one of the issues for this
2 panel. So, I don't know how to direct you with
3 specific requests, except that we are going to want to
4 review these environmental performance questions in
5 some detail, and it will affect system capability. And
6 it may be another case where, at future panels, we are
7 going to have to ask questions related to system
8 capability.

9 Thank you very much, those are my only
10 submissions.

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1 [11:22 a.m.]

2 MRS. FORMUSA: Would you like me to
3 address that last point?

4 THE CHAIRMAN: Yes.

5 REPLY BY MRS. FORMUSA:

6 Because I think it is a matter that
7 several of the other parties had raised with respect to
8 the line to be drawn between Panel 2 and the option
9 panels.

10 And as I said before, Panel 2 is intended
11 to talk about the system, the integrated system, its
12 technical cost and environmental characteristics, but
13 not to take that system apart and focus in on one
14 particular aspect of the system such as hydraulic.

15 We want to talk about, when one operates
16 this existing system, there are implications for the
17 environment, for instance, such as acid gas emissions.
18 But in terms of the impact of those emission on the
19 environment, including health, those would be matters
20 for later panels.

21 But it is difficult to talk about the
22 existing system in a vacuum. One has to talk -- we are
23 in a certain environment, we have to describe that
24 environment. But to the extent that that picture is
25 rounded out, the details about that environment are

1 perhaps better dealt with when the experts with the
2 particular expertise are on the later panels rather
3 than bringing one of each or two of each forward onto
4 this panel.

5 So, it's fair ball in the later panels to
6 talk about, for instance, the nuclear option, both in
7 terms of the existing system, how that option performs,
8 what it costs, its impacts on the existing system, and
9 also that option as a future option. The two are
10 fairly closely linked.

11 THE CHAIRMAN: Mr. Power?

12 SUBMISSION BY MR. POWER:

13 Robert Power for South Bruce.

14 Just a small minor to clarify, if I may.
15 I believe myself and Mrs. Formusa agreed that, on page
16 11 of the matters to be deferred to a later point, it
17 refers to matters being deferred to 6, 8, and 9. Panel
18 7 should also be included in there.

19 THE CHAIRMAN: I am not following you.

20 MR. POWER: Sorry. We have agreed,
21 generally, that some of the questions or issues South
22 Bruce have identified should be laid over to Panels 6,
23 7, 8, and 9. Seven is not referred to in there, so --

24 THE CHAIRMAN: What page are you on?

25 Page 11?

1 MR. POWER: Page 11, sir.

2 THE CHAIRMAN: Right.

3 MR. POWER: So just add Panel 7 in there.

4 And then, we have further agreed that

5 South Bruce would be able to ask general questions
6 regarding those issues on Panel 2 but, as has been
7 discussed, refer the more specific questions to those
8 panels.

9 I am just noting that Panel 7 should be
10 included in there in case there is any confusion at a
11 later date..

12 THE CHAIRMAN: Thank you, Mr. Power.

13 That's agreeable, Mrs. Formusa?

14 REPLY BY MRS. FORMUSA:

15 Yes, thank you. I have taken that into
16 account. Maybe I should address some of the other --
17 if I can do it for everyone, maybe all at once, and
18 then if I have missed anything, it will save people
19 getting up and down.

20 If we could turn first to the statement
21 of proposed issues? Up until the break, it remained
22 intact and then I had an opportunity to meet with Mr.
23 Kelsey for Northwatch. We have agreed to make two
24 changes to that, and they both occur on page 3 of that
25 document.

1 Under point No. 6, we would like to add
2 item E, as in Edward, and that would now read: "How
3 reliability methodology and resulting reserve margins
4 compare with other utilities."

5 Then we have added an eighth point, No.
6 8, and it is not really a heading, it's a sentence.
7 And it will read: "Generally, the application of these
8 issues to Northern Ontario."

9 We had originally thought those matters
10 could have been encompassed in the wording there, but
11 then agreed that perhaps more specific wording would be
12 more helpful. And that's...

13 In the matters to be addressed later on,
14 I denoted a handwritten little star to show parties
15 where we had made changes, even subsequent to some of
16 our conversations, so it may be that they will want to
17 get back to me just in terms of how we made further
18 re-allocations.

19 What I was hoping to do by Friday was to
20 reissue a whole package, as Mr. Campbell did for Panel
21 1, called the Panel 2 Scoping Package, that would
22 include the statement of issues, the matters to be
23 addressed, and all the parties' statements of concern.

24 So, Ms. Harvie and I will spend,
25 hopefully, just the rest of today and perhaps tomorrow

1 just ascertaining that we have captured everyone's
2 concerns, we haven't left anything off, and they
3 understand why matters are, in part, deferred to other
4 panels.

5 If I can just address for Northwatch,
6 again on page 4 of the matters to be deferred, we have
7 added his issue No. 4 from his statement of concerns.
8 And that issue No. 4 will be dealt with in its entirety
9 in Panels 8, 9, and 10. So, that's new from last
10 night.

11 As Mr. Castrilli pointed out on page 8,
12 we will add paragraphs 2C through 2H on page 8.

13 THE CHAIRMAN: And they will go to Panel
14 7?

15 MRS. FORMUSA: Yes. All will be to in
16 part to Panel 7, that's correct.

17 I have taken Mr. Power's point on page 11
18 and added Panel 7.

19 Those are all the changes I have made
20 since just this morning. As I said, though, I did want
21 to make sure that all the parties felt comfortable
22 about the starred items, which they may have only seen
23 this morning.

24 What's happened in this process, we have
25 all been learning a little bit more about each other's

1 use of language, and what we mean by certain statements
2 of concern, and what we mean by an issue. And that's
3 why we have been putting things in and out of Panel 2
4 in part to later panels.

5 So, we have just been refining some of
6 those details, and I think that captures everything
7 that we have had discussions about. So, what I had
8 hoped to do was to get consensus from the parties and
9 issue a new package containing the three documents by
10 Friday.

11 I want to see if there are any other....
12 If I might just raise one matter that has caused some
13 confusion and may have caused confusion in your
14 minds -- unless we have a fire.
15 ---Off the record discussion.

16 MRS. FORMUSA: It's Panel 7. And you may
17 wonder why some matters with respect to transmission
18 and alternative technologies, like solar energy, have
19 been deferred to Panel 7, because when one looks at the
20 witness statement, one sees the Manitoba purchase and
21 transmission associated with that.

22 I want to clear up some of that
23 confusion. What has been happening with
24 interrogatories is that we have been allocating
25 questions with respect to alternative technologies and

1 details about the transmission system generally in our
2 plans for that system to Panel 7. That's because when
3 one looks at chapter 14, that's the chapter that kicks
4 off the discussion on major supply options, and the
5 witness statement goes right to the Manitoba purchase
6 and transmission, but leaves out perhaps the first
7 seven pages of that chapter. That was unintentional, I
8 suppose.

9 What we intend to do is add experts most
10 likely to that panel to deal with both issues. In any
11 event, it is around Panel 7 that those two matters are
12 appropriately addressed, so, for now, we are saying it
13 is Panel 7. There will be people to address those two
14 aspects, and that is why we have said that those matter
15 are deferred to 7. So that part of the witness
16 statement will have to be revised and I hope to do that
17 shortly.

18 Subject to what some of the other parties
19 might want to say, I hope I have made it clear that in
20 terms of the ability of the witnesses to speak to the
21 details of the options, they will answer questions
22 under cross-examination to the extent that they are
23 able to. And when it goes beyond their expertise, they
24 will advise the person cross-examining and refer the
25 matter to the later panel. And I believe there is a

1 fair degree of flexibility in terms of that later
2 panel.

3 THE CHAIRMAN: It might be convenient at
4 that point, if that occurs, that the intervenor who has
5 further questions already to ask might then possibly in
6 some form or another make those questions known, so
7 they could be maybe treated as interrogatories. Would
8 that be a process that would be useful?

9 MRS. FORMUSA: I think the intervenors
10 will have to address that. Certainly if we have
11 questions --

12 THE CHAIRMAN: Well, I am thinking of
13 someone coming along prepared to ask a series of
14 questions and then, all of a sudden, gets stopped, not
15 quite properly, by the witness saying, 'That is beyond
16 where I can go.'

17 Maybe they will want to, at least,
18 because they are ready and prepared and don't want to
19 have to prepare a second time, months later possibly,
20 put those questions on the record at that time in some
21 fashion, and maybe they could be treated as
22 interrogatories and that might help everybody.

23 MRS. FORMUSA: If that assists in
24 preparation for the later panels and the hearing of
25 that evidence, then we would certainly be prepared to

1 answer questions put to us at that time.

2 THE CHAIRMAN: Anybody else now? Yes,
3 madam?

4 MRS. DeQUEHEN: I am speaking for
5 Northumberland Environmental Protection.

6 THE CHAIRMAN: What is your name, please?

7 MRS. DeQUEHEN: Mrs. DeQuehen.

8 THE CHAIRMAN: Are you one of the public?
9 What page are they on?

10 MS. PATTERSON: What page in the matters
11 to be addressed?

12 MRS. FORMUSA: Page 15.

13 THE CHAIRMAN: 15, thank you.

14 Yes?

15 SUBMISSION BY MRS. DeQUEHEN:

16 We just have two concerns. One is the
17 matter of interrogatories; that is, when issues are
18 split up between performance and future options. In
19 order to analyse future options, one requires to have
20 information on records and past performance and will
21 require to have it.

22 We just want to be quite sure that we
23 won't be cut off from the information we require for
24 future panels by a response that past performance and
25 records have already been dealt with in Panel 2. We

1 would just like that assurance from Hydro that they
2 will be forthcoming with information which we will
3 require in future because, I mean, all future analysis
4 depends largely on past records.

5 The second --

6 THE CHAIRMAN: Do you want to address
7 that, Mrs. Formusa?

8 MRS. FORMUSA: I can address that right
9 now and say that Mrs. DeQuehen's understanding is
10 correct: that they will not be cut off from dealing
11 with details with respect to past performance of the
12 existing system in the options panels.

13 MRS. DeQUEHEN: The second --

14 MRS. FORMUSA: Sorry. To the extent that
15 it's relevant and the level of detail, those issues, of
16 course, to be left for later on.

17 MRS. DeQUEHEN: The second point is just
18 that we would like assurance that, although we are not
19 putting evidence in this panel because we don't wish to
20 duplicate and we also feel that our point of view will
21 be dealt with by the other environmental groups and
22 hence it isn't necessary for us to put our own point of
23 view in detail, we still wish to retain the right to
24 cross-question should it be necessary. ...

25

1 [11:25 a.m.] THE CHAIRMAN: Well, I think you can
2 certainly ask questions on panels at appropriate times,
3 yes. There is no restriction on that, is there, Mrs.
4 Formusa, as I understand the question?

5 MRS. FORMUSA: No. I think, my
6 understanding of the concern earlier was that Mrs.
7 DeQuehen was concerned that if she wanted to, she could
8 cross-examine Panel 2, even though she does not have a
9 specific concern here. I believe that arose on the
10 Panel 1 scoping session.

11 MRS. DeQUEHEN: I think the point is that
12 we do have specific concerns here. We just merely feel
13 that our actual point of view will be put by other
14 groups. But should matters arise which we feel we
15 should challenge, should claims be made, et cetera, we
16 would just like to retain the right to question.

17 THE CHAIRMAN: And they have put in
18 statements of concern, is that right?

19 MRS. DeQUEHEN: We have put in a
20 statement of concern.

21 THE CHAIRMAN: Then you certainly will be
22 able to cross-examine.

23 MRS. DeQUEHEN: Thank you.

24 THE CHAIRMAN: In fact you are going
25 about it the right way. You are making sure that you

1 don't cover areas that other people have already
2 covered.

3 Anything else?

4 Yes, Ms. Purdy.

5 MS. PURDY: Good morning. I just wanted
6 to make a point to clarify with respect to our
7 statement of concern.

8 THE CHAIRMAN: You are again -- you are
9 the Sierra Club?

10 MS. PURDY: That is right. It is page 21
11 of the latest...

12 THE CHAIRMAN: What page, 21?

13 MS. PURDY: Page 21. It is No. 5.

14 SUBMISSION BY MS. PURDY:

15 In the original memo from Ontario Hydro,
16 of April the 22nd, No. 5 was deferred to Panels 6, 7, 8
17 and 9. And then, this morning's change has our No. 5
18 issue deferred to, only to Panel 6 and 10. We wanted
19 to clarify that we intend to address this issue in more
20 than Panel 6 and 10. We would intend to address it in
21 7, 8, 9 and 11.

22 I did have a discussion with Ontario
23 Hydro's counsel, and I thought we had that by
24 agreement, and I am not sure, since Mrs. Formusa stood
25 up, that that is the case.

1 In any event, we take issue with the
2 deferral only to 6 and 10.

3 THE CHAIRMAN: Mrs. Formusa?

4 MS. FORMUSA: My understanding, I think
5 this can be resolved by saying that to the extent that
6 we read the issue, we thought it was in Panel 6 and 10.
7 Ms. Purdy is not precluded from raising those issues in
8 other panels, but, the way it was phrased, we thought
9 it was, on looking back at it, it was more 6 and 10,
10 looking at the interests that they were pursuing.

11 So, I think she's concerned about buying
12 into that it is only acceptable on 6 and 10. To the
13 extent that in later statements of concern, she has
14 concerns for 6, 7, 8, 9 and 10, then she's not
15 restricted from raising those in those panels. We had
16 just read that one as being 6 and 10.

17 MS. PURDY: We just wanted to make sure
18 for the record that we were not restricted in our
19 ability to...

20 THE CHAIRMAN: Yes, if you raise a
21 question that is relevant to those other panels, then,
22 of course, the concern can be dealt with.

23 MS. PURDY: Yes, thank you.

24 THE CHAIRMAN: Anything else? Anyone
25 else?

(Scoping of Panel 2)

1 Well, that then seems to deal with the
2 scoping session of Panel 2, and I certainly don't want
3 to rain on the harmony that seems to be here, but there
4 are a couple of concerns that I personally thought
5 about over the weekend. The Globe & Mail says that I
6 muse, and maybe this could be characterized as musing,
7 but I'm not inviting any responses, but I just want to
8 raise some things with you this morning.

9 I guess it was prompted by the statement
10 in the original document from Ontario Hydro that they
11 would not be addressing certain things in chief, but
12 matters could be subject to cross-examination, subject
13 to relevance. I'm not sure I'm quoting it correctly,
14 but that was generally the issue.

15 So, there were two caveats -- one caveat,
16 at least, on some of these matters is a relevance
17 position, and the other is, I guess, the ability of
18 some of the witnesses, looking at the list of
19 qualifications of the witnesses in the overall Hydro
20 witness panel, one at least raised the issue of whether
21 they would have the necessary expertise to answer some
22 of the questions on some of the issues that have been
23 raised.

24 That particular point has been raised
25 with at least one intervenor, that the witnesses may

1 not have the expertise to answer some of the questions,
2 and perhaps not in the necessary detail to
3 satisfactorily deal with that.

4 So, that leads me to think about what do
5 we do with issues that have been raised by the parties
6 which aren't part of the Ontario Hydro case, if I can
7 put it that way, because I can't quite divert, get
8 myself free from the background from which I come,
9 which is a little more structured and adversarial than
10 this process is.

11 And you start, I guess, from the general
12 proposition that it is up to the proponent what kind of
13 case it wants to put in and what evidence it wants to
14 bring and what knowledge and expertise its witnesses
15 have, and it is their choice and their alternative.
16 The risk they take, if they don't make it, is that they
17 would be subject to an application analogous to a
18 nonsuit: Failure to meet the requirements of Section 5
19 of the Environmental Assessment Act. That would be a
20 risk that they might face, if their evidence was not
21 sufficient, either in the expertise of the people that
22 they were calling, or the ability of them to give the
23 necessary detail.

24 But the other issue that then comes to my
25 mind is to what extent can Hydro put in its case, and

(Scoping of Panel 2)

1 then wait for the intervenors to put in their evidence,
2 and then deal with some of the issues raised by
3 intervenors in reply? And that issue has also been
4 raised by at least one intervenor who has put on record
5 that, as Hydro is aware of the issues that have been
6 raised, they, in the opinion of this intervenor, should
7 not, in effect, split its case by ignoring the issue in
8 its own case, and then coming in with it in reply.

9 That gets me to consider issues that have
10 been raised by intervenors, and how those should be
11 dealt with, and I guess they fall into three
12 categories, really.

13 What I'm really trying to avoid is
14 getting a problem at the end of Hydro's evidence, when
15 Hydro wants to bring in reply evidence, and people say,
16 "Well, they are splitting their case." I don't want
17 that to happen. I know they can avoid that happening,
18 but I think I'd like to just give some random thoughts
19 about it.

20 There are three kinds of issues that
21 D might be raised by intervenors: One is, if I can put
22 it this way, an issue that is clearly relevant, and
23 which is recognized as such by Ontario Hydro, and on
24 which they will be presenting evidence with a
25 significant degree of detail. That doesn't present

1 much of a problem.

2 More of the problem is the kind of matter
3 which Hydro might regard as a non-issue, but which has
4 yet been squarely raised by some intervenors, and I
5 think those probably should be identified as early as
6 possible, to avoid the very problem that I am thinking
7 about.

8 I think there may be some issues raised
9 by intervenors, which it would be more appropriate for
10 the intervenors to bring in the evidence and Hydro to
11 reply to it, rather than for Hydro to have to meet
12 issues which they do not consider to be significant
13 issues, rightly or wrongly.

14 There may be issues in which, after
15 hearing the evidence of the intervenors, the Panel may
16 decide that there is no -- that there is nothing in the
17 issue, and that Hydro doesn't need to address it in any
18 fashion. I don't know whether there are such issues,
19 but there is a possibility that there might be.

20 I guess I just wanted to put these
21 thoughts on the record in an early stage in the
22 proceedings, really to avoid there being any
23 difficulty, because I see some possibilities that
24 matters like this might arise down the line.

25 I'd like it to be out that, at least, we

(Scoping of Panel 2)

1 thought about it. I'd like the party to think about it
2 early on in the process.

3 I'm not suggesting for a minute that
4 there should be any change to the arrangements that
5 have been made to Panels 1 or 2.

6 MR. GREENSPOON: May I speak to that?

7 THE CHAIRMAN: Mr. Greenspoon?

8 MR. GREENSPOON: Lloyd Greenspoon for
9 Northwatch.

10 SUBMISSION BY MR. GREENSPOON:

11 I was a little concerned, prior to your
12 raising the issue - perhaps I misunderstood you - about
13 how we would deal with that issue, but I think it is
14 clear now. And my position would be, in anticipating
15 my cross-examination on Panel 1, which is coming up
16 soon, that if I ask a question on cross-examination
17 that is relevant to the panel, and Hydro has somebody
18 who can answer that question, but that person is not
19 here, I think Hydro has to bring that person or be able
20 to show why that question should not be answered in
21 this panel but in another panel.

22 And I think that principle should apply
23 to cross-examination in all panels, that, basically, if
24 the question is relevant, that it clearly applies to
25 the Panel that we are at. That the danger is, yes,

1 Hydro will split their case, if they don't answer the
2 question then.

3 THE CHAIRMAN: Well, you don't have to
4 say anything, Mrs. Formusa. I'm just really throwing
5 this out as something to think about. I'm not
6 proposing to make any definitive rulings at this time.

7 MRS. FORMUSA: I think I might just
8 comment on Mr. Greenspoon's suggestion in terms of
9 overall what we have been thinking about with respect
10 to issues. There are so many parties. I think it is
11 fair to say if we try to address everything in detail
12 in chief, our case would be considerably larger, and I
13 know that is not what you are asking to us do.

14 I think what Mr. Greenspoon is suggesting
15 is we need to deal with it when it arises at the time.
16 And we will be developing procedures as we go along.

17 I see scoping as one such procedure where
18 we can start to address these issues. Other
19 procedures, already I'm meeting with some of the
20 parties with respect to issues where we know we are
21 going to tangle on relevancy and level of detail, and
22 we are trying to sort those things out behind the
23 scenes.

24 So we see it to be difficult to say right
25 now, "Well, let's develop a procedure that will

1 encompass all of these problems," and we are certainly
2 cognizant of the concerns you are expressing, and we
3 hope to deal with them as we meet each one, if we meet
4 them.

5 But I think it is more appropriate to
6 wait, as Mr. Greenspoon says, and maybe a transcript
7 undertaking can do it, maybe you'll have to bring
8 another witness back. It is difficult to say now, in
9 general, but we take your concerns. Thank you.

10 THE CHAIRMAN: We are going to now take
11 our morning break, and then resume with the evidence on
12 Panel 1, the cross-examination of the MEA.

13 Before I forget, I have to read in
14 another participant. Mr. A. R. Burge, B-u-r-g-e, is
15 added to the list of participants.

16 We will now adjourn for 15 minutes.

17 ---Recess at 11:50 a.m.

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...

1 ---On resuming at 12:10 a.m.

2 THE CHAIRMAN: Mr. Campbell?

3 MR. B. CAMPBELL: Mr. Chairman, arising
4 out of -- perhaps before arising out of last week, I
5 should advise the Board that, over the weekend, Mr.
6 Rothman cleverly threw his back out, and I gather
7 long-term sitting offers some discomfort to this. I
8 told him if it gets at some level of unbearable, that I
9 will leave to his judgment, he is perfectly entitled to
10 say that he is distracted to the point that he can't
11 pay proper attention, and we will do whatever is
12 necessary to deal with it. I told him that I was
13 confident that there would be no problem with that and
14 we hope that it won't be necessary, but I just thought
15 I should let you know in advance.

16 Secondly, Mr. Rothman indicated that he
17 wanted to check with his staff about some productivity
18 matters related to the Ontec model of which he spoke.
19 He is prepared to do that first thing today.

20 With respect to Mr. Burke, Mr. Burke
21 referred to two interrogatories in his testimony when
22 he did not have those numbers at hand. He is prepared,
23 as I understand it, to give the interrogatory numbers
24 that he referred to on Friday.

25 And finally, there is one additional

1 matter which Mr. Burke would like to deal with. I am
2 told that on reviewing the transcript, there is a
3 conclusion for which the transcript indicates that Mr.
4 Burke -- or would lead one to believe that Mr. Burke
5 agrees with a particular conclusion, and he would like
6 the opportunity to correct that. He feels that his
7 position is not correctly stated in what is recorded in
8 the transcript.

9 On this latter matter, I spoke to my
10 friend Mr. Mark on Friday morning and I advised him
11 that Mr. Burke wished to speak to a matter. I do not
12 know exactly -- in fact, I don't know at all from Mr.
13 Burke what the area is, he just advised me that he
14 wanted to correct this matter. The only reason I raise
15 it, I think it is somewhat more complicated than simply
16 saying this number should be, in fact, three higher or
17 three lower.

18 MR. MARK: Mr. Chairman, before Mr. Burke
19 begins, Mr. Campbell correctly points out that he and I
20 have spoken about this, and Mr. Campbell assures me
21 that he hasn't spoken to Mr. Burke about exactly what
22 the matter is, but I think this is an appropriate time,
23 perhaps, to consider the parameters of this exercise we
24 go through where the witnesses review the transcripts
25 and come back and make what we shall call corrections.

1 I have no objection whatsoever if a
2 witness has misspoken himself on a number or a
3 reference, or if he has said that, given some
4 information subject to check with some staff members
5 who may know better.

6 I am very much concerned, though, that
7 this not be an opportunity for witnesses under
8 cross-examination to reconsider answers they have given
9 which were not those type of mistaken references, but,
10 having had the benefit of some time and some
11 questioning, they think maybe they ought to have, or
12 could have, or might have, approached something
13 differently.

14 And I think that is a purpose for which
15 this procedure should not be used, as I say, unless we
16 have what is clearly a mistake in numerical or exhibit
17 reference, or something like that, I don't think it's a
18 appropriate for the ground to be revisited.

19 THE CHAIRMAN: Well, I guess it's a
20 matter of it depends, doesn't it. If there is the
21 mistake in the transcript - although the transcripts to
22 date look as if there is very little room for that -
23 then that should be corrected. Then there is the
24 inadvertent mistake, reference to a wrong full number
25 as you suggest, and that kind of thing. And then there

1 is the reconsideration of the answer. And the
2 reconsideration of the answer, I guess, is what you are
3 really --

4 MR. MARK: Yes.

5 THE CHAIRMAN: I would think the
6 appropriate way to do that would be, if Mr. Burke
7 wants to reconsider the answer, he should say, "On
8 reflection, I would like to reconsider my answer to the
9 question I was asked yesterday concerning..." whatever
10 the subject is, and then it would be up to you, or the
11 cross-examiner, whether you wished to allow him to do
12 that. If you didn't wish to allow him to do that, I
13 think the answer would have to stand. If you wish to
14 allow him to do it, then he could do it.

15 MR. MARK: Well, having been given a
16 right of veto, I guess I can't object.

17 THE CHAIRMAN: I won't say that's going
18 to apply in every case but, generally speaking --

19 MR. MARK: Perhaps, in more general
20 terms, my concern is if we are going to have these
21 cross-examinations which are going to go overnight and
22 go over weekends, there is an opportunity for
23 re-examination, as there is in every case.

24 We have a practice here of permitting the
25 witnesses to review transcripts, and I think it would

1 be inappropriate to make a habit of witnesses' using
2 the recesses and the breaks to reconsider issues which
3 have been dealt with in cross-examination and come back
4 and get another crack at them. That is really my
5 concern. If that's going to be what the procedure is
6 going to turn into, it's quite unfair.

7 I guess today I am content. It's the
8 first time it has come up. Perhaps we should hear what
9 Mr. Burke has to say, but I do harbour that strong
10 concern.

11 THE CHAIRMAN: Generally, it is a
12 concern, but I think it is one that has to be dealt
13 with in each individual case, because the ultimate
14 thing, what we want to do is we want to get the best
15 evidence that Mr. Burke can give, and that's what we
16 really want. It is true of any witness.

17 Any comments on that?

18 MR. B. CAMPBELL: No, that certainly is
19 satisfactory, and I think it is just a sensible way to
20 proceed, in that this is a long hearing with
21 complicated issues, and certainly our practice has
22 always been, in cases of this type - and I think it is
23 a good practice - that if this can be done during the
24 course of the cross-examination, it makes the evidence
25 flow all that much better and deals with issues as they

1 arise in a fair way. So, as far as I am concerned,
2 that's certainly quite satisfactory.

3 I guess on that basis, perhaps if Mr.
4 Rothman, and then Mr. Burke, could deal with the
5 matters that are outstanding.

6 MITCHELL PIERSON ROTHMAN,
7 PAUL JONATHAN BURKE,
7 LILY BUJA-BIJUNAS; Resumed

8 MR. ROTHMAN: Yes. On Thursday, Mr.
9 Mark, at page 742 of the transcript, you asked me what
10 the actual Ontec forecast was before it was
11 judgmentally pegged at 1.7, and I said that I would
12 consult with staff and bring you back an answer.

13 The answer is that we didn't use the
14 Ontec model in the way that we have used the LISA
15 model. And, in effect, the Ontec model was run more to
16 produce detail from a forecast that, effectively, had
17 been arrived at judgmentally before the model was run.

18 So that, instead of working iteratively
19 with Ontec, we essentially assumed the productivity
20 growth rate and then ran Ontec through. The reason for
21 doing that is the nature of Ontec; it was a
22 demand-driven, not supply-driven, model and so it
23 wasn't as readily capable of producing a productivity
24 growth rate endogenous as was LISA.

25 MR. MARK: I am sure, at least,

1 that that is something I will take up with my expert
2 over the lunch hour, and if I want to revisit it, I
3 will then.

4 THE CHAIRMAN: Yes.

5 MR. BURKE: First, the matter of the
6 interrogatories. At page 709, line 6, I referred to an
7 interrogatory that described some of our work and
8 pending work on the peak load, peak energy
9 relationship. And that interrogatory is numbered
10 1.10.29. And at page 711, line 24, I referred to an
11 interrogatory that dealt with the relationship between
12 weather-corrected peak and weather-corrected energy,
13 and that was 1.14.56.

14 Now, the other matter that I would like
15 to look at again, I guess the nub of it is contained in
16 the transcript on page 702, line 8, where Mr. Mark
17 says: "I thought we had agreed that there's more
18 uncertainty associated with the prediction of load
19 growth than there is GDP growth." And then, lower down
20 on the page, "but you agreed with that statement a few
21 moments ago. Do you want to stay with that answer?"
22 And at that point I agreed.

23 I think Mr. Mark will agree that the
24 point --

25 THE CHAIRMAN: Mr. Mark, do you have any

1 problem with his elaborating on that?

2 MR. MARK: I do.

3 THE CHAIRMAN: I think those answers,
4 then, will have to stand.

5 MR. BURKE: Well, I guess...

6 THE CHAIRMAN: They may be subject to
7 reply questions that come up when Mr. Campbell has an
8 opportunity to ask you questions in reply, but if Mr.
9 Mark --

10 MR. B. CAMPBELL: Mr. Chairman, could I
11 address this?

12 I understand that Mr. Mark is doing no
13 more than exercising the right that you gave him, but
14 it does seem to me if we could revisit this matter for
15 a moment, that, where something like this is clearly a
16 matter that is also going to be of interest to other
17 cross-examiners, that to simply leave it for reply has
18 the potential to cause all kinds of problems.

19 As I said, I have no idea what Mr. Burke
20 is going to say, but obviously, it's some kind of
21 explanation relating this area. And I would have
22 thought that the best thing to do was to have that on
23 the record now, so that other cross-examiners would
24 have the benefit of that, and be in a position to shape
25 their questions accordingly. Otherwise, it seems to me

1 that, at the end of the day, the possibility raises
2 itself, perhaps not in this case, but perhaps -- that
3 we then have to get back into this cycle all over again
4 if people have relied on that answer with which Mr.
5 Burke is clearly not happy.

6 THE CHAIRMAN: Well, nevertheless, I
7 think we are going to have to let it stand the way the
8 record is.

9 MR. BURKE: Well, could I just say
10 something?

11 I was going to move to another answer
12 that I am definitely not happy with in the sense that
13 it was not interpreted correctly by Mr. Mark.

14 THE CHAIRMAN: Well, that is a matter --
15 the record has to stand for that, I think.

16 MR. MARK: I think that's right, Mr.
17 Chairman. I am concerned we are getting into an area
18 where we are just frustrating one of the purposes of
19 cross-examination.

20 Mr. Campbell has raised a concern. I
21 certainly am not taking this position so that evidence
22 doesn't come out at the end of the day, but if I am
23 going to conduct a cross-examination, I just can't be
24 faced with this scenario.

25 THE CHAIRMAN: I accept that position.

1 MR. MARK: Mr. Chairman, just before I
2 commence, I want to introduce the analyst who is
3 assisting me today. His name is Dr. Dan Violette. He
4 is a principal of the firm RCG Hagler Bailly in
5 Colorado. He has a doctorate in economics. He is very
6 experienced in utility planning and forecasting
7 exercises, and is one of those people having an
8 analytical responsibility for, amongst other panels,
9 Panel 1. He will be joining me at the counsel table.

10 THE CHAIRMAN: Thank you.

11 CROSS-EXAMINATION BY MR. MARK (Cont'd):

12 Q. Mr. Rothman, if I could take up with
13 you, please, on some of the aspects of your economic
14 forecast that we were discussing last week.

15 I would like to turn, at this point,
16 please, to the subject of interest rates for a moment.
17 As I understand it, you have expressed your forecast of
18 interest rates, in the plan document and the update, in
19 terms of nominal rates, and you have also expressed
20 your projection of inflation rates. Is that how it's
21 generally presented?

22 MR. ROTHMAN: A. I believe that's how we
23 write it down, yes.

24 Q. And have you calculated what your
25 projection of real interest rates over the planning

1 period we are dealing with is?

2 A. Yes.

3 Q. And could you give that to us,
4 please?

5 A. Well, I have calculated, there are
6 various ways, of course, to calculate real interest
7 rates.

8 Q. I have assumed that here we are
9 talking about taking your projection of nominal
10 interest rates, subtracting your projection of
11 inflation rates and getting your real interest rate.

12 A. Well, in fact, dividing by your
13 projection of inflation rates and getting --

14 MR. GREENSPOON: We can't hear you.

15 MR. ROTHMAN: Sorry. You take the
16 nominal interest rate and you divide it -- nominal
17 interest rate forecast, divide it by a forecast of
18 inflation rate, and get from that a forecast of real
19 interest rates.

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...

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1 [12:26 p.m.] I don't have the numbers here with me,
2 unfortunately, in any systematic way. As I said in my
3 direct evidence, we expect the average real short-term
4 interest rate to fall to about 3 per cent by about
5 2005, so that would be a treasury bill rate from the
6 current 5.5 per cent.

7 MR. MARK: Q. That treasury bill rate,
8 isn't that different from what we would commonly call
9 the real interest rate? Or is that the one you are
10 using?

11 MR. ROTHMAN: A. We can take a nominal
12 interest rate and a short-term instrument like a
13 treasury bill, subtract from it the short-term
14 forecast, that is, the forecast of short-term
15 inflation, or divide from it, the forecast of short
16 term inflation, and get a forecast of a short-term real
17 rate --

18 Q. Let me see if I can shorten it,
19 somewhat. I don't know if you have looked at the
20 numbers. The calculation that was done for me very
21 recently indicates that in your plan document, you
22 forecast using the methodology we discussed, an average
23 real interest rate of 3.9 per cent for the period 1991
24 to 2010. Does that sound about right?

25 A. Subject to check, that would sound

1 about right.

2 Q. And I am told that, if we do the
3 comparable calculation for the numbers projected in
4 Exhibit 15, the long-term economic outlook, you get a
5 prediction of an average real interest rate over the
6 same period of 5.4 per cent. Subject to check, does
7 that sound correct? At real prime.

8 A. Real prime.

9 THE CHAIRMAN: Where was the 5.4 per
10 cent, Mr. Mark?

11 MR. MARK: That comes from Exhibit 15,
12 the long-term economic outlook. Also for the period
13 1990 to 2010.

14 MR. ROTHMAN: Yes, that sounds about
15 right.

16 MR. MARK: Q. What factors have led you
17 to increase your projection of the real prime 1-1/2
18 points between your 1988 projections and today?

19 MR. ROTHMAN: A. Well, when I said
20 "about right," I am a little surprised. I had thought
21 that our real rates for long-term bonds had been
22 somewhat higher than that and...

23 Q. We're talking about long-term prime.

24 A. I'm sorry, Mr. Mark. I think that it
25 would be -- I would certainly prefer to have some time

1 to confer with staff on this question, partly to check
2 what, in fact, these numbers are and what our forecasts
3 were, because I don't have this readily available in my
4 briefing material. So, I'm just wondering whether, in
5 fact, there was as large an increase in the forecast of
6 real interest rates over that period of time as you are
7 suggesting.

8 Q. That's fair, and perhaps you can do
9 that and we can consider later how we can revisit that,
10 if at all.

11 But let me ask you this: Do you recall
12 that you, in fact, increased your projection of the
13 interest rates between the two forecasts?

14 A. We increased our forecast of
15 long-term real interest rates quite a long time ago.
16 It's been my understanding that we have kept it
17 reasonably constant since then. We have had -- in the
18 last year, there would have been some increase in
19 medium-term real interest rates as a result of our
20 expectations about capital needs, as I said, in Eastern
21 Europe, and, more recently, in Kuwait, though that
22 wouldn't have been in the September '90 economic
23 outlook.

24 But I don't recall any discussions about
25 significant increases in our long-term real interest

1 rate forecast between 1988 and 1990. So, I am saying I
2 would like to go back and check that with staff.

3 Q. Fair enough.

4 Is the 5.4 per cent figure that we talked
5 about as being the result of the figures contained in
6 Exhibit 15, is that a figure you believe to be
7 accurate?

8 A. It's my understanding that we have
9 been forecasting a real interest rate on long-term
10 Hydro borrowings of around 5 per cent for some time, in
11 the 4 to 5 per cent range. A prime rate would tend to
12 be higher than a long-term bond borrowing rate, so it's
13 not impossible that that's there.

14 Q. So, if your recollection about your
15 forecast of bond rates is correct, then we are, as I
16 suggested, looking at a long-term prime rate forecast
17 of something over 5 per cent?

18 A. Yes, that would be right.

19 Q. Is there any period in recent history
20 which you can identify where real rates have averaged
21 over 5 per cent for such a long period of time?

22 A. Real prime?

23 Q. Yes.

24 A. We have had long-term real prime
25 rates quite high in the later -- in the early part of

1 the 1980s and the middle part. We now know exactly
2 what the numbers were like.

3 Q. But in terms of a period of time in
4 the order of 20 years or so, is there some period in
5 recent history where you have achieved that long-term
6 average of over 5 per cent?

7 A. There may not have been. Our
8 forecast is that -- our forecast for real interest
9 rates suggests that we look at factors in the financial
10 markets, and what has happened in the past has been
11 that these long-term real interest rates are determined
12 by supply and demand factors in the financial market.

13 We have an historical period, if we look
14 back 25 years, when real interest rates were
15 historically at very low levels, they were at such low
16 levels because both borrowers and lenders essentially
17 under-estimated the amount of inflation that would
18 occur and that would occur over a reasonably long
19 period of time.

20 In the '80s, I would call that period of
21 low interest rate a large part of the 1970s. In the
22 1980s, both borrowers and lenders began to adjust to
23 expectations of higher inflation rates, and in
24 adjusting real interest rates have increased.

25 We also believe that real interest rates

1 are at least partly a function of whether governments
2 are large borrowers or not, and governments have been
3 and will continue to be large borrowers, keeping real
4 interest rates relatively high.

5 Q. Your forecast of interest rates, are
6 they used for other financial planning purposes in the
7 corporation?

8 A. They are used for planning the
9 financing strategy for the treasury division.

10 Q. Do you know whether the interest
11 rates that you project are taken into account in
12 determining the discount rates that are used in the
13 plan before us in costing the various alternatives?

14 A. Yes. They are.

15 Q. In general terms, would the -- if
16 interest rates in the future turn out to be lower on
17 average that you are projecting, would that have the
18 effect of reducing the costs of the capital-intensive
19 options?

20 A. It would have the effect of reducing
21 the costs of all options.

22 On the subject of real interest rates and
23 our forecasting accuracy, we have looked at our past
24 forecasting accuracy for real interest rates over the
25 last decade or so, over the period of the 1980s.

1 Over the period from 1981 through '86,
2 our average forecast of real interest rates, that is,
3 we forecast from 1981 through '86 an average real
4 interest rate of about 4.2 per cent, the actual over
5 that period was 5 per cent. These are real interest
6 rates on long-term government bonds. Our forecast
7 record has actually been quite good in making those
8 long-term real interest rate forecasts.

9 If we look at the rates that we forecast
10 for 1991 to '95 over that period, our mean forecast is
11 again about 4.1 per cent for real interest rates over
12 1991 to '95. Our current forecast is for about 4.7 per
13 cent real interest rates on long-term government bonds
14 over that period. But we have been fairly consistent
15 in terms of the real interest rates that we have
16 forecast. And insofar as historical data are available
17 for those forecasts, we have been reasonably accurate
18 in making them.

19 Q. Have you compared your forecasts of
20 real interest rates contained in your update with those
21 of other long-term forecasters?

22 A. I don't believe that we have compared
23 our forecasts of real interest rates with those of
24 other forecasters, no. And of course there are, as we
25 have said, there is not a large community of long-term

1 forecasters with which to compare.

2 Q. The community, such as it is. And
3 you have told us the members of that community
4 before -- do they produce forecasts of interest rates
5 comparable with their other forecasts, in terms of
6 time?

7 A. I believe that somewhere in this
8 briefing material, I have what comparisons are
9 available. Let me see what I can find.

10 Q. I am just interested to get them at
11 some point, Mr. Rothman. We don't necessarily have to
12 take the time now. Perhaps you could subsequently
13 advise us whether those forecasts are available from
14 those other people and, if so, just furnish us with
15 them.

16 A. At least some of them, I am sure, do
17 forecast interest rates.

18 Q. Thank you.

19 Mr. Rothman, let me turn for a couple of
20 minutes to the subject of your natural gas price
21 forecasts. Is it fair to say, over the period of time
22 we are talking about in this planning exercise, we can
23 expect there to be essentially one North American
24 natural gas market with roughly equivalent prices on
25 both sides of the border?

1 A. Yes. I apologize once more, Mr.
2 Mark. I have agreed one of the things that I said I
3 would do earlier was to check this apparent increase in
4 interest rate. Can you go back and give me more
5 precisely what your two calculations were that you have
6 asked me to compare?

7 Q. What I believe I have done is taken
8 the -- in the long-term economic outlook, September
9 '88, table 8.1 -- pardon me, 8.2, you have --

10 I'm sorry, I was wrong. It was at table
11 8.1, you have your forecasts of your prime rate for
12 Canada.

13 A. Yes.

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1 [12:40 p.m.] Q. And you have your forecast of
2 Consumer Price Index, and we used for Ontario, you have
3 it for both Canada and Ontario.

4 And I'm suggesting to you that, if you do
5 the mathematics to get the resulting real interest
6 rate, and you average it over the period 1990 to 2010,
7 you get an average of 3.9 per cent. For your
8 assistance Mr. Rothman, I'm told that for the period
9 1991 to 1995 you have -- and just for your assistance,
10 if you look in the same table, you find it over
11 five-year periods as well?

12 A. Yes, I know that.

13 Q. And it would be the same exercise,
14 with the equivalent numbers for the update.

15 Can we go back to natural gas?

16 A. Yes.

17 Q. I think you had agreed with me that
18 we can expect to see, more or less, a unified North
19 American natural gas market with equivalent prices on
20 both sides of the border?

21 A. Yes, yes, pretty much. There are
22 some transportation constraints, but a fairly unified
23 natural gas market.

24 Q. And do you have any sense, Mr.
25 Rothman, of where your forecast of the price of natural

1 gas over the period 1990 to 2010 stands in relation to
2 forecasts of others who are in the business of doing
3 that?

4 A. Well, because there are, as a result
5 of these, of the transportation constraints, some
6 regional variations in prices, and because even without
7 transportation constraints there are different
8 transportation costs for gas in different areas, it is
9 not always as easy as one might like to compare gas
10 prices, because you don't always get apples with which
11 you can directly compare with other apples.

12 But, insofar as such comparisons are
13 possible, I believe that our projections, for example,
14 of wholesale natural gas prices at Toronto, are within
15 the range of other available forecasters.

16 Q. Who are the other forecasters?

17 A. Well, the other forecasters that we
18 monitor regularly include DRI, the National Energy
19 Board, ourselves, and I believe a forecasting -- yes, a
20 Canadian forecasting company, energy forecasting
21 company called Enerdata.

22 Q. And your forecast of natural gas
23 prices over the period 1990 to 2010, am I correct that
24 you are projecting an average 3.6 per cent real growth
25 per year?

1 A. Over which period?

2 Q. 1990 to 2010.

3 A. I thought our price increase was
4 higher than that. The number that I have in front of
5 me is 4.2 per cent.

6 Q. Where are you taking that from, Mr.
7 Rothman?

8 A. From table 7 of Exhibit 14, but there
9 are some additional calculations, and I don't know
10 right off what those additional calculations might be.
11 It should be directly from the table. In this case, it
12 should be fairly easily, directly from table 7 of
13 Exhibit 14, which is on page 34 of that exhibit.

14 I am sorry, yes, what I have given you
15 was a Canadian average Fieldgate price, rather than an
16 Ontario wholesale price.

17 Q. Yes. Try page 33, table 6.

18 A. From page 33, table 6, we get 3.6?

19 Okay.

20 Q. Does that sound about correct?

21 A. Yes.

22 Q. What do you understand to be the
23 National Energy Board's latest forecast of the average
24 price increase over the same period?

25 A. Well, that is partly why I was

1 quoting the average Fieldgate prices. That I have a
2 direct comparison to the National Energy Board's
3 forecast for that. Where our forecast is about 4.3 per
4 cent growth over that period, their forecast is 4.6 per
5 cent growth -- oh, sorry. I am sorry.

6 I'm reading this table -- I'm reading the
7 prices in constant dollars per thousand cubic feet
8 rather than growth rate.

9 Our forecast for growth rates from 1990
10 to 2010 is 5.1 per cent in real terms, whereas theirs
11 is 5.7 per cent in real terms over that period.

12 Q. That is on the, what is it, the
13 Fieldgate?

14 A. Average Fieldgate price, yes.

15 Q. Do any forecast which is comparable
16 to the Ontario average wholesale price, which I have
17 referred to a minute ago, in table 6?

18 A. I don't know whether they do such a
19 forecast or not.

20 Q. And what is the -- how recent is
21 the...

22 A. Yes, I am sorry. I take that back.
23 They must do an Ontario wholesale price, because I have
24 some comparisons of that. The NEB does do an Ontario
25 wholesale price. I just don't have numbers comparing

1 it right here.

2 Q. Are those numbers that we could get
3 from you?

4 A. Yes.

5 Q. Are you also forecasting a rather
6 rapid narrowing of natural gas prices and oil prices
7 over the same forecast period?

8 A. Yes.

9 Q. Is that consistent with the forecasts
10 of others in this field, do you know?

11 A. Our oil price forecast is consistent
12 with those of others in this field.

13 Q. I guess if we put the two together,
14 we should get the same results.

15 All right, to change horses completely,
16 Panel, I want to deal with in some detail the question
17 of your end-use models, and I guess Dr. Buja-Bijunas,
18 this is most properly directed to you.

19 Is it fair to say in general terms that,
20 in your end-use models, you use elasticities as the
21 input to the model?

22 DR. BUJA-BIJUNAS: A. Let me start with
23 each sector at a time.

24 Q. Well, can we generalize or not? I'd
25 rather thought that one of the hallmarks of the

1 end-use...

2 A. We do not...

3 Q. If I could just finish.

4 I'd rather thought that one of the
5 hallmarks of the end use modeling process is that by
6 and large you import the elasticities into the model.

7 A. We do not make or input specific
8 assumptions regarding elasticities in the end-use
9 analysis, the way they normally are defined. The
10 elasticities that are in that particular interrogatory
11 that you referred to that...

12 A. I am sorry, which one did I refer to?

13 Q. There are elasticities, 112-30.

14 Their end-use elasticities.

15 Q. Right.

16 A. They were calculated after the fact,
17 after we had...

18 Q. No, no, no, no. I haven't referred
19 to that one yet. I may get to it later, and there are
20 a lot more elasticities...

21 A. I just thought you misinterpreted
22 that we put that in as opposed to getting it out.

23 Q. No, there are a lot more elasticities
24 than the one you are referring to just in 112-30, and
25 we may get to those. Can we just deal with it on a

1 more general level?

2 A. I'm just trying to get at what you're
3 asking. If you're asking me--

4 Q. It is a simple question.

5 A. --is there an input somewhere that
6 says, please put in the elasticity of space heating,
7 there is no input anywhere in the end-use model is the
8 case.

9 However, there are behavioural equations
10 that have a number of explanatory variables that have
11 certain coefficients on them. Those coefficients
12 determine indirectly what the elasticity would be.
13 That is what I mean by we don't put in a value.

14 Q. The coefficients, the things in the
15 model which tell you what the behavioural relationships
16 are.

17 A. That is right.

18 Q. All right, those are not generated by
19 the model as they are in an econometric model, rather
20 they are input by the forecasters.

21 A. That is not right, either.

22 In the command case or the commercial
23 sector, they are actually autocalibrated and generated
24 by the model. Whereas in the REEPS case, we start off
25 with coefficients, which were default coefficients from

1 the EPRI model. And where we found the results biased,
2 we made adjustments. So, it is a combination of
3 things.

4 Q. Fair enough.

5 MR. BURKE: A. Could I just add
6 something here?

7 I think you implied that the econometric
8 model somehow calculated the elasticities within them.
9 That is not the case, either. They are estimated with
10 historical data, and the results of those estimations
11 are equations that are in the model.

12 Q. Dealing with the REEPS then, Dr.
13 Buja-Bijunas, it is delivered to you with the default
14 coefficients in there from EPRI?

15 DR. BUJA-BIJUNAS: A. That is right.

16 Q. And when you -- you spoke in your
17 evidence-in-chief about calibrating--

18 A. That is right.

19 Q. --the models. That is, as I
20 understand it, not the same thing as re-estimating
21 these coefficients, is it?

22 A. No. To re-estimate the coefficients,
23 you would have to do extensive surveys to collect
24 Ontario-specific data, which would be a very large
25 undertaking.

1 What we did was change coefficients, not
2 based on actual reestimations, but so as to be able to
3 reproduce historical numbers for the residential
4 sector.

5 For example, historical air conditioning
6 penetrations that we have noticed over the last few
7 years in Ontario, the coefficients that were in the
8 REEPS model did not pick that up at all. So, we
9 realized if we continued using those coefficients, we
10 wouldn't really be able to stand behind the forecasts.

11 So, instead we altered the coefficients,
12 where we had historical data, to indicate that REEPS
13 would not have been able to pick it up the way it was.

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1 Q. So have you somehow systematically
2 tested these models against some actual set of data?

3 A. Yes. Actually what we did was that
4 we rebased REEPS in 1978 data, which means normally, in
5 end-use models, you start with the current situation,
6 because often that's the most complete data set that
7 you have. But what we did do was to rebase, starting
8 in 1978, all the stock, equipment numbers, et cetera,
9 and we put in actuals for things like prices and
10 household forecasts and use that to do an electricity
11 forecast. By using the actuals for prices and
12 household numbers, et cetera, what you are getting out
13 of the forecast is the model doing its thing. You are
14 not getting a forecast that is off because your price
15 numbers are incorrect, or a forecast which is off
16 because your household forecasts are wrong, you are
17 actually getting the behaviour of the model.

18 When we did that, we found a number of
19 end-uses. REEPS did not at all give us saturations
20 that actually were historically measured over the '78
21 to '88 period, and it was in those cases that we felt
22 we had to make alterations.

23 Q. And did you do that for all of the
24 major coefficients?

25 A. Not for all of them but for things

1 like air conditioning and space heating fuel shares,
2 and for a number of them. Not for things like
3 refrigerators or very traditional 100 per cent
4 saturation sort of end-uses.

5 Q. How did you determine which ones you
6 were you going to look at? Was it some sort of
7 systematic approach?

8 A. Basically, when we rebased it in
9 1978, we then compared end-use by end-use, which
10 end-uses were not behaving properly, and from that they
11 gave an indication.

12 The other thing, we did not just look at
13 historical performance; the other thing we looked at
14 was looking at the forecast using from 1990 onward,
15 using the REEPS coefficients as they were. In some
16 end-uses, we got dramatic increases in share of things
17 like oil water heaters going up dramatically as being
18 the water heating choice, and our field representatives
19 said they hadn't noticed anything like that happening.

20 So, in some cases, we got results that
21 were rather untenable, or alternatively, people were no
22 longer going to buy dishwashers. In fact, the
23 saturation of dishwashers was going down. Things like
24 that that when we talked to manufacturers who had sales
25 forecasts, they couldn't understand why we would have

1 such peculiar penetrations for some end-uses. So, in
2 those cases, we made alterations.

3 Q. And are we now talking about just
4 REEPS, which is the residential model?

5 A. Yes, that's right, yes.

6 THE CHAIRMAN: I know it's right in the
7 middle of something, but perhaps we should break for
8 lunch.

9 MR. MARK: That's fine.

10 THE CHAIRMAN: I gather your microphone
11 isn't working properly; is that right?

12 ---Off the record discussion.

13 THE CHAIRMAN: We are adjourned then
14 until 2:30.

15 ---Luncheon recess at 1:00 p.m.

16 ---On resuming at 2:30 p.m.

17 THE CHAIRMAN: Mr. Mark?

18 MR. MARK: Thank you, Mr. Chairman.

19 Q. Dr. Buja-Bijunas, let me go back to
20 you, please, and pursue something you started to talk
21 about before the luncheon break.

22 Would it be fair to say there must be
23 some difference in the applications to which you can
24 put econometric models on the one hand and end-use
25 models on the other? They must have different

1 strengths and weaknesses.

2 DR. BUJA-BIJUNAS: A. I think that's a
3 very accurate statement, yes.

4 Q. And what do you see as being the
5 relative strengths or weaknesses of the two and where
6 they would each best be used in the forecasting
7 process?

8 A. The end-use concept is a very
9 physical way of doing modelling because you look at
10 physical commercial floor space and you look at actual
11 households and the houses and how they are constructed,
12 and you look at industrial energy use in terms of how
13 newsprint is produced, the actual pulping processes, et
14 cetera. It allows you, by thinking that way, to add in
15 a lot of disaggregated detail regarding what sorts of
16 equipment or appliances, et cetera, are out there using
17 electricity currently, and you are able to also
18 visualize in the future how that's going to change in
19 very physical terms.

20 It certainly assists you when you are
21 doing DSM analysis because programs are for physical
22 things. Programs are for things like lights and so you
23 want to be able to compare DSM impacts with your load
24 forecast and the end-use analysis speaks with the same
25 language.

1 Econometrics, though, have a lot of
2 advantages also, insofar as they can relate things to
3 more aggregate parameters like income levels and GDP
4 and things like that. So, if you want to see an
5 overall impact of an aggregate parameter, the
6 econometric approach is somewhat more feasible than
7 going through all the detail of an end-use approach.

8 Q. And you have used an apt example
9 because I was going to ask you, if one wanted to, for
10 example, estimate the impact of the regulation of
11 appliance efficiencies, you would be more apt to use a
12 end-use model to do that.

13 A. Very much so, yes.

14 Q. And staying with the econometric
15 model for a moment, when you estimate an econometric
16 model, your inputs are the historical data?

17 A. That's correct.

18 Q. And you use the data in the model to
19 tell you what the behavioural relationships are?

20 A. That's correct.

21 Q. And in the end-use modelling, the
22 model is constructed with the behavioural relationships
23 as inputs?

24 A. That's correct.

25 Q. And am I correct that those

1 behavioural relationships are themselves generally
2 derived from other analyses, for example, other models,
3 and in some cases econometric models?

4 A. The behavioural equations in REEPS,
5 for example, yes, they are logit equations from a U.S.
6 data base.

7 Q. And when we talk about, as you have
8 spoken about, the default parameters, those are the
9 ones that come built in from EPRI?

10 A. When you get the model they come with
11 defaults, you don't necessarily use them but they do
12 come with defaults.

13 Q. Am I correct, if you don't substitute
14 some other parameter yourself, the model will use the
15 default?

16 A. EPRI supplies users with a functional
17 code and so there has got to be something in there to
18 run the model.

19 Q. With the end-use models that you
20 have, is it fair to say that you have three basic
21 components that have to be estimated for each end-use
22 and they are, firstly, appliance or equipment stocks by
23 end-use; secondly, the energy efficiency of each
24 appliance or piece of equipment, and thirdly, the
25 utilization of each appliance or piece of equipment?

1 A. That's correct, yes.

2 Q. And to describe it in its simplest
3 terms, conceptually what you do is that estimates are
4 developed for each of those and then an estimate of the
5 total energy consumed by that end-use can be
6 calculated?

7 A. That's correct.

8 Q. And at the end of the day you add up
9 all the results for the various uses or equipment you
10 are looking at and you get some more aggregate total?

11 A. That's right.

12 Q. We spoke earlier this morning before
13 the luncheon recess about the parameters in the REEPS
14 model and we had some discussion about your adjustment
15 of those parameters, you recall that discussion?

16 A. Yes.

17 Q. The REEPS, of course, comes with the
18 default values.

19 A. That's right.

20 Q. And do you know when the EPRI models
21 were estimated by EPRI?

22 A. The data base itself was constructed
23 in 1978 or so. There was an estimation initially in
24 1983, and there might have been a re-estimation in '86.
25 We are talking, basically, the mid-80s based on a data

1 base from the '70s.

2 Q. And it is 1978 data base that's used,
3 that's my information.

4 A. Yes. The version of REEPS which in
5 broad use uses the 1978 data base.

6 Q. And is that data base the national
7 U.S. data set or is it some regional data set, do you
8 know?

9 A. I'm not 100 per cent certain, but I
10 think it is the national U.S. for most end-uses with
11 some change for things like the space heating part of
12 it which might be regional, but I am not totally -- for
13 COMMEND I know that's the case, but I am not too sure
14 it is for REEPS.

15 Q. Before I move on, I just want to make
16 sure I properly understand your testimony this morning.
17 You have re-estimated some of the parameters but only
18 some?

19 A. We haven't re-estimated; we have
20 changed them. We have not collected the sort of
21 information that is required to re-estimate
22 coefficients of logic functions.

23 What we have done is changed coefficients
24 so that the calculated values are closer to our
25 historically-measured values for things like share,

1 electricity consumption. That's not a re-estimation;
2 it's an adjustment.

3 Q. But do you sum default values? You
4 haven't adjusted them --

5 A. Oh, yes, we do. We haven't adjusted
6 all of them, just some of them.

7 Q. I am advised, Doctor, that with
8 respect to one parameter, and that is for the appliance
9 choice simulation, the default in REEPS is such that it
10 projects that no fuel switching occurs; is that the
11 case?

12 A. There is a very small amount of fuel
13 switching that does occur.

14 I think what that really refers to is
15 that no proper estimation was done of fuel switching to
16 give you appropriate coefficients for your behavioural
17 equations in REEPS, so the default was set up so that
18 very little in the way of fuel switching actually
19 occurred.

20 When we run the model, the fuel
21 switching, we do get some, but it is a very, very small
22 amount.

23 Q. And have you changed this assumption?

24 A. No. It's consistent with the fuel
25 switching that actually has occurred.

1 Q. If I understand it correctly, the
2 consequence or the assumption that's built in is, for
3 example, if a furnace wears out, it will always be
4 replaced by another furnace that uses the same fuel?

5 A. No, it is allowed -- I am just saying
6 that the equations that are in there are such that the
7 result is very little fuel switching occurs. I am also
8 saying that looking at the fuel switching that has
9 occurred historically, that number actually is a small
10 number.

11 Q. So you are satisfied it's a good
12 parameter for your purposes?

13 A. Insofar as it reproduces historical
14 number, it's consistent.

15 Q. Doctor, you mentioned in your
16 testimony this morning that you went back and you
17 checked to see how the models did compare to some
18 actual historical data.

19 A. That's right.

20 Q. And what data set is there? Did you
21 do periodically some survey work to get the data
22 against which you compare the model performance?

23 A. If you look at the residential
24 sector, we do have data going back to 1978. As far as
25 the saturation rates, for example, or the appliance

1 pick-up, there is a document called the Market
2 Reference Data Set which includes residential appliance
3 surveys done by Ontario Hydro and that gives the
4 evolution, during that period, of the shares of various
5 types of appliances, so we compared against that.

6 Total electricity consumption is readily
7 available every year during that period, and for the
8 commercial sector we were only able to go back as far
9 as 1982. But, there also we had disaggregated results
10 going back to 1982. So, it's in-house Ontario Hydro
11 data basically.

12 Q. The market reference data set, that's
13 Exhibit 81, is it?

14 A. I don't have the exhibit.

15 MR. BURKE: A. Yes, it's No. 81.

16 Q. Doctor, do you have that?

17 DR. BUJA-BIJUNAS: A. I do, yes.

18 Q. Open it, if you would, please, to
19 Table 2.5A. That's on page 41.

20 A. Yes, I have got it.

21 Q. This is the table that shows
22 appliance ownership for the years 1973 to 1987?

23 A. That's right.

24 Q. Looking across at the top row we see,
25 first --

1 THE CHAIRMAN: Hold it just a moment, Mr.
2 Mark. I don't think we have all got it yet. Is this
3 Table 2.5A, Appliance Ownership?

4 MR. MARK: Yes, sir.

5 ---Off the record.

6 THE CHAIRMAN: All right. Thank you, Mr.
7 Mark. It's all right to go now.

8 MR. MARK: Q. Looking across the top
9 row, we see first 1973 and then it jumps over to 1980.
10 Does that signify that you don't have a comparable data
11 set for the intervening years?

12 DR. BUJA-BIJUNAS: A. I can't answer
13 that question, I am not sure. I know we have 1978 data
14 but I am not sure if we have the previous years.

15 Q. All right. So, you are certain you
16 do have '78 data but that's not reflected in here?

17 A. Yes. I think what the market
18 research department does, which puts together this
19 entire listing, is that they usually present a certain
20 number of years and when they do each update, it's
21 another year dropped, so basically, they just want to
22 show a certain amount. That's why I want not sure what
23 we have between '73 and '80, whether we have every
24 single year or just certain years, I'm not certain.

25 Q. And where exactly are these numbers

1 derived from? I want to make sure I understand it. Is
2 there some actual billing information or survey data
3 that you have that allows to you, for example, estimate
4 or determine the number of these various appliances
5 listed here?

6 A. What the market research department
7 does is that they have what's called a residential
8 appliance survey which is mailed out to 120,000
9 customers, and that's done -- it was done at some point
10 in the '70s, I am not sure when, but it was also done
11 1980, '83, '86, '88, 1990, and it asks --
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25 ...

1 [2:49 p.m.] Q. Could you give me those years again?

2 A. 1980, 1983, 1986, 1988, and 1990.

3 And it's a mail-out, one page, basically,
4 questionnaire, which asks people very straightforward
5 questions like: Do you have a freezer? Do you have a
6 refrigerator? Is it frost-free? Do you have an air
7 cleaner? All the various things you see listed in this
8 market reference data set.

9 And from the responses, the research
10 department puts together penetration rates that are in
11 place in each year specified. So, they use a survey
12 technique to produce those particular penetration
13 rates.

14 Q. And would I be correct in assuming
15 that for the years where those surveys are not sent
16 out, there is some simple process of extrapolation or
17 something else, which is used to fill them in?

18 A. I can't speak for what they do. My
19 assumption would be that we do have yearly data for
20 consumption in the residential sector; we do have that.

21 Q. Is that for gross consumption by
22 class? I am not sure what you are referring to.

23 A. It's called SRC data, Standard
24 Residential Classification, so it is by residential
25 building type; municipal utilities supply that

1 information. So we do have the consumption figures
2 actually on a quarterly basis and --

3 Q. But that will just tell you the total
4 sectoral consumption.

5 A. That's right.

6 Basically, what it says is that we have
7 estimates of the consumption per refrigerator, for
8 example, of the previous year; the following year we
9 have total consumption. One can derive potentially
10 what the number of appliances are for the intervening
11 years. But I don't do this calculation, so I am not
12 certain. All I know is that the residential appliance
13 surveys are not done every year.

14 Q. And if you turn with me, overleaf, to
15 Table 2.6A.

16 A. Yes.

17 Q. And this is the usage of those same
18 appliances, the annual usage.

19 A. That's correct.

20 Q. And do you know whether these figures
21 are derived from that same survey and data set that you
22 spoke about a moment ago?

23 A. These figures are used with the
24 survey, the residential appliance survey. There is no
25 metering done during the residential client survey, so

1 it is not as though someone measures what the
2 refrigerator consumes. All you get is number of
3 appliances from the survey. That's combined with what
4 the total residential consumption is, and estimates of
5 what the average annual use is per appliance. And all
6 three sets of figures are combined to yield a
7 consistent result.

8 Q. I'm looking, for example, at on this
9 Table 2.6A -- let's just take one, freezers, you see
10 that? It's 8 or 10 lines down under refrigeration.

11 A. Yes.

12 Q. Are you with me?

13 A. Yes.

14 Q. I'm looking across there and I see
15 for the years 1980 right through the end of the table
16 1987, it is a constant use, average annual use figure.

17 A. That's right.

18 Q. Is that intended to represent the
19 actual or -- I am just surprised it doesn't change.

20 A. As I said, we do not put together the
21 market reference data set. I think the constancy of
22 the numbers often indicates the fact that there may be
23 gaps between which years the RAS are done, and in
24 between years they insert a constant unit energy
25 consumption for these appliances.

1 Q. We appear to have a constant here for
2 virtually the whole span of the years '81 through '87.

3 A. Yes. What I will say is that if you
4 look at our load forecast, we do not have constant unit
5 energy consumptions. This is a data set put together
6 by the market research department, and we use their
7 saturations because they are based on audits, surveys
8 that are done on a relatively routine basis.

9 Our unit energy consumptions are based on
10 a number of sources; this being one of them. And if
11 you look at our load forecast document, you will notice
12 our unit energy consumptions are actually different
13 these these numbers to some extent.

14 One of the --

15 Q. Go ahead.

16 A. You will notice one thing if you look
17 down the various end-uses, you have a "miscellaneous"
18 category. Okay. You have a total consumption and you
19 have an allotment across various end-uses. And by
20 keeping the annual use constant from year to year,
21 basically your "miscellaneous" takes up your shortfall
22 from the total consumption number that you actually
23 have as a measured value.

24 Q. So, in this collection of data then,
25 your "miscellaneous" category is really the remainder?

1 A. Basically, yes. So, what we have
2 done is that in the load forecast, our unit energy
3 consumptions vary from year to year so our
4 "miscellaneous" category is somewhat different. It's a
5 matter of whether you want to stay with an average
6 annual use or whether you want to have some behaviour
7 in it.

8 Q. I just want to make sure I understand
9 this. Is this table, the information in this table
10 2.6A, used in the REEPS modelling process or not?

11 A. It's an iterative procedure. The
12 numbers in this table were used initially as estimates
13 for our models. When we were doing our analysis, we
14 used a number of other sources to indicate some of
15 these numbers should be adjusted.

16 That information flow went back to the
17 market research department, and for further updates for
18 the 1990 update of this document, which just became
19 available recently, those numbers are more consistent
20 with the numbers we used in the load forecast than what
21 was historically in here. So, the information goes
22 back and forth. If we learn something, if we have
23 additional data, we feed it back to them. If they
24 learn something, they feed it back to us. We don't
25 work in vacuum.

1 Q. The 1990 report that you have just
2 referred to, is that an exhibit in this hearing?

3 A. I don't think so. I just got it
4 recently. I'm not sure.

5 MR. MARK: Could that be made available,
6 Mr. Campbell?

7 MR. B. CAMPBELL: Yes, I don't think
8 there is any difficulty with that. Perhaps we should
9 have an exhibit number.

10 MR. MARK: We can reserve one.

11 THE CHAIRMAN: That's probably more
12 logical. Can we reserve the next exhibit number.
13 What's the number.

14 REGISTRAR: 103.

15 ---EXHIBIT NO. 103: Reserved.

16 MR. MARK: Thank you, Mr. Chair.

17 Q. Do I go to that document to find the
18 average annual use numbers that underlie your most
19 recent end-use residential model forecast?

20 DR. BUJA-BIJUNAS: A. They are not
21 necessarily consistent. If you want to find the actual
22 numbers used in the end-use report, I would go to the
23 end-use report.

24 All of the unit energy consumptions, both
25 for existing stock in place and for new acquisitions,

1 are all listed in the residential end-use report and
2 the appendix, which gives the detailed annual results.

3 MR. MARK: Your indulgence for a moment,
4 Mr. Chairman.

5 ---Off the record discussion.

6 MR. MARK: Q. Which exhibit exactly do I
7 find this in?

8 DR. BUJA-BIJUNAS: A. If you look at the
9 1990 -- Exhibit 16.

10 Q. Yes.

11 A. The main report, not the appendix.

12 Q. Yes.

13 A. For example, if you look up
14 refrigerators. Okay, page 10 of Exhibit 16.

15 Q. Yes.

16 A. It will give you the unit energy
17 consumption for refrigerators for new housing or for
18 the total stock of housing which incorporates existing
19 refrigerators, divided up into primary refrigerators,
20 the main refrigerator used in your house, and the
21 secondary refrigerator which is usually an older
22 refrigerator you keep in your basement.

23 So for the year 1990, we use the number
24 1266 kilowatt hours per refrigerator. If you look in
25 the market reference data set, they use a number of

1 about 1200. That's what I am saying: They are not
2 quite the same.

3 Q. Let me just stop you there.

4 And are you referring to this table 2.6A
5 for the number 1200?

6 A. That's correct.

7 Q. But I want to make sure I understand
8 it. You still don't - if I have it correctly - you
9 don't have anything which purports to be more close to
10 actual numbers for this historical period 1980 to 1987;
11 that's isn't around someplace?

12 A. Actual of a unit energy use or --

13 Q. Yes.

14 A. That's not quite true either. For
15 some appliances - I think refrigerators are a good
16 example - we went back to look at sales data from
17 EnerGuide, for example, CAMA information, et cetera,
18 and we did come --

19 MR. B. CAMPBELL: Sorry. You better
20 explain CAMA.

21 DR. BUJA-BIJUNAS: Canadian Appliance
22 Manufacturers Association.

23 And we looked at the distribution across
24 the various sizes and features of refrigerators. And
25 in the EnerGuide listings, the kilowatt hours

1 consumptions across the various models and estimated
2 out what the average consumption must have been.

3 So, in some instances we did some
4 calculations like that, but it's not as though there is
5 a whole set like this of those sort of calculations.

6 MR. MARK: Q. Fair enough.

7 And in the newer numbers you have, this
8 document which will come at some point, is your
9 "miscellaneous" category still determined the same way?
10 It's the remainder?

11 DR. BUJA-BIJUNAS: A. Basically, yes,
12 yes.

13 Q. If we stay on Table 2.6A for a moment
14 and given its nature, I am not going to be as long as I
15 had thought on this document, but let's look at the
16 "miscellaneous" category. Are you with me, Doctor?

17 A. Yes, I am.

18 Q. I see, for example, from 1981 to
19 1982, we see a drop from 244 to 193. Does that, as the
20 person responsible for the forecast, tell you anything,
21 signify anything to you about these numbers?

22 A. I wouldn't ascribe too much
23 significance to those numbers for the following reason.
24 In this table, as you can see, "miscellaneous" is a
25 true residual, and the size of it is brought about by

1 the underlying assumptions for the average annual use
2 for the other specified end-uses. And as you
3 commented, a lot of those numbers are kept at round
4 figures like 2200, et cetera.

5 That residual is a very small number that
6 is bound to fluctuate, so I would not put too much
7 significance to that. The "miscellaneous" we have, the
8 "other" category, contains far more end-uses than the
9 "miscellaneous" in this table. The "other" that we
10 have in our load forecast actually includes lighting,
11 clothes dryers, secondary heating, TV sets, et cetera,
12 is a different compilation of "other" than the
13 "miscellaneous" in this.

14 Q. And the "miscellaneous" you have that
15 underlies the forecast, is that a combination of some
16 specific projections and the remainder?

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...

1 [3:04 p.m.] A. What it is is the forecast of that
2 "other" as opposed to miscellaneous, okay? The
3 forecast of "other" was estimated using a basic
4 regression equation, using income as the main driver.
5 We looked at, using some historical data, basically
6 this data...

7 Q. Sorry, "this" refers to?
8 A. Sorry, the market reference data set.
9 Q. As to table -- any particular table?
10 A. The actual consumption, which I think
11 is one more table down. If you look at the average
12 energy use times the number of customers, you get
13 consumption per end-use.

14 So, we put together lighting, television
15 sets, you know, the key end-uses, where there is some
16 data, plus the residuals. So, we have that "other" not
17 accounted for by what REEPS models, which is your space
18 heating, your air conditioning, your dishwashers your
19 large appliances. So, we modeled that "other" versus
20 income and got a regression equation, which was then
21 used to forecast out the "other" category.

22 So, it is a forecast of a somewhat more
23 aggregate commodity, but the way we produced the
24 historical data set for that was looking at the
25 consumption for lighting and all sorts of other things.

1 Q. But am I correct that your "other"
2 category includes some appliances, which you forecast
3 individually, and a residual category of appliances?

4 A. No, REEPS allows you to forecast
5 about eight appliances or so. Everything that is
6 residual to that is our "other" category. We do not
7 forecast specifically lighting, we do not forecast
8 dryers, we do not do that.

9 We forecast the consumption of all these
10 things as an aggregate other, which is driven by income
11 as the main driver. Because historically, the
12 historical data base showed income to be a good driver.

13 Exhibit No. 16, which I was referring to
14 a few minutes ago, the main report for the residential
15 sector, an explanation of what is included in "other"
16 is found on page 13. In addition to historical growth
17 of "other," what our forecast is, what it means, and
18 other features regarding how we handle "other".

19 Q. So, does your other category
20 include -- does it include dishwashers, for example, or
21 not?

22 A. No, dishwashers are handled by REEPS
23 directly. So it does not include that.

24 Q. Doctor, before we started today, I
25 provided to you through your counsel an exhibit which

1 just takes a page out of one of your exhibits and adds
2 some numbers to it. Have you had a chance to look at
3 that? That is a copy of page 36 from the load forecast
4 report.

5 THE CHAIRMAN: What exhibit number is
6 that, please?

7 MR. MARK: I have prepared a -- I
8 prepared a separate sheet, which I'd like to tender as
9 an exhibit.

10 THE CHAIRMAN: That is the one you just
11 distributed?

12 MR. MARK: Yes.

13 THE CHAIRMAN: But what exhibit is it
14 derived from?

15 MR. MARK: It is derived from Load
16 Forecast Report 90.12.10, which is Exhibit 9.

17 THE CHAIRMAN: Nine? Can this be marked
18 then as the next exhibit, which will be 104?

19 THE REGISTRAR: 104, Mr. Chairman.

20 ---EXHIBIT NO. 104: A copy of page 36 from the Load
21 Forecast Report, 90.12.10, Exhibit
9.

22 MR. MARK: Thank you, Mr. Chairman.

23 Q. Do you have that now?

24 DR. BUJA-BIJUNAS: A. Yes, I do.

25 Q. And the table it is taken from in

1 your filed documents shows the change in consumption by
2 end-use between 1990 and 2015 in the various
3 categories. I'm now talking about the top table,
4 4.1.3.

5 A. That is right.

6 Q. And you will see what we have done on
7 the right-hand side is added up the increase in the
8 consumption, and then calculated the percentage of the
9 total change represented by each of the end-uses.

10 A. That is correct, yes.

11 Q. Are these numbers correct as far as
12 you can tell, subject to check?

13 A. They look as though they are of the
14 right size. I can't tell you if they are dead on, but
15 they certainly look, on a relative basis, correct.

16 Q. What we see from this then is that
17 out of the growth in the end-uses in the residential
18 sector that you see from 1990 to 2015, 73.2 per cent of
19 that is in the category nominated other.

20 A. That is correct.

21 Q. It is that category, I think you have
22 told us, that you used the simple equation? Which was
23 the equation you were referring to? I think...

24 A. It is a regression equation that uses
25 income.

1 The one thing I might add is that when
2 you use the word simple, we didn't do it end-use by
3 end-use. We didn't do it appliance by appliance. But
4 we did recognize the fact that within other, the sorts
5 of end-uses included will be changing. About
6 three-quarters of "other" currently is accounted for by
7 lighting, TV's, clothes dryers, end-uses which are
8 close to reaching full saturation, and we recognize
9 that.

10 Because of that, historical growth in
11 "other" was about 5.5 per cent. Our "other" growth is
12 driven by income, but we only had it going at 2.8 per
13 cent, realizing that a large portion of "other" is
14 reaching saturation. It is the "other" portion which
15 is accounted for by things like PCs and VCRs and
16 Jacuzzis, et cetera. That is very income responsive
17 and keeps the growth rate going. But we do -- it is
18 not as though it is continuing to grow at a 5.5 per
19 cent rate. It is not.

20 Q. I wasn't particularly interested in
21 the 5.5 per cent number. I want to turn a moment to
22 the equation that we talked about.

23 Is this the one where in your testimony
24 in-chief you indicated that you found that variables
25 for persons per household and price of electricity were

1 not significant? Do you recall that?

2 A. I don't really recall that. It
3 was -- the only...

4 Q. It is my information, let me help you
5 with this. It is my information that the variables in
6 the EPRI model are 4 for that, for this category. And
7 that they are the number of persons per household,
8 household income, electricity price, number of rooms.

9 A. Okay, I'm not sure I actually said
10 it, but you will find that statement indirectly
11 mentioned in the document, where when we did the
12 regression analysis, we found those two variables to be
13 insignificant according to T staff, et cetera. The
14 only two that had any significance with our data were
15 income and number of rooms, which is an indicator of
16 size of home.

17 The other two, price of electricity and
18 household size, were not significant with our data
19 base.

20 Q. So does that tell us that in your
21 projections you don't see this other category really as
22 being responsive to changes in electricity prices?

23 A. The forecast is based on an equation
24 which does not have electricity price as an explanatory
25 variable.

1 Q. It doesn't have it, because you found
2 that it is insignificant?

3 A. It was found insignificant, because a
4 lot of the contributors to that "other" category are
5 things like sauna heaters and PCs, where the purchase
6 is not really determined by the price of electricity.

7 Q. Where did you get the historical data
8 which you used to run the regression model?

9 A. It was a combination of the market
10 reference data set, and StatsCan, household facilities
11 and equipment. And as far as the income levels and
12 average household size, that is from within our
13 division.

14 So, its either StatsCan or the market
15 reference data set or other information from within the
16 division.

17 Q. One of the inputs to this model is
18 the KWH.

19 A. That is right.

20 Q. And does that come from the market
21 reference data set, or does that come from someplace
22 else?

23 A. It comes from a combination. Some of
24 that comes from there, and some of it comes from -- I
25 can't remember the name of the document. An example

1 is, saving the "other" energy in homes, "Energy Auditor
2 and Retrofitter," December 1987.

3 There are certain sources of information
4 which give you, by typical appliances, what the wattage
5 would be, which you combine with utilization
6 assumptions, to then give you your kilowatthour
7 consumption of that appliance per year.

8 Q. You estimated the model, did you not,
9 Doctor, with annual Ontario data covering the 1973 to
10 1988 period?

11 A. You mean for the "other" category?

12 Q. Yes.

13 A. That was '81 to '88.

14 Q. I'm looking at Exhibit 16, page 13.
15 You see section 2.8, "Other End-Uses"?

16 A. Yes, I see that.

17 Q. Just let me take you to the
18 reference, Doctor, so you know where I'm going. Down
19 towards the bottom, when you are describing your model,
20 the last sentence, it says:

21 "The parameters of this equation were
22 estimated with annual Ontario data
23 covering the 1973 to 1988 period."

24 A. The data I have in front of me
25 covers the 1981 to '88 period. I'm not certain where

1 this 1973 to '88 comes from.

2 Q. So which...

3 A. Can I just check out to see? The
4 individual that I work with, who generated the
5 equation, I certainly can check with him to see which
6 data base he used.

7 Q. Fine.

8 A. Whether it is '73 to '88, or '81 to
9 '88.

10 Q. That was going to be my question. Do
11 you know which it was, and is your concern where did
12 the data come from? Or you don't know which data set?

13 A. Oh, I know where the data comes from,
14 but the only data I've seen is '81 to '88. If he did
15 it somewhat differently -- I have to check with him to
16 see what he's done.

17 Q. Check with him, if you would please,
18 and when you do that, if in fact the parameters were
19 estimated with what purports to be annual Ontario data
20 covering the period '73 to '81 as well, would you give
21 us some indication of where that data comes from and
22 how it is compiled?

23 A. Okay.

24 Q. Thank you.

25 ...

1 [3:20 p.m.] The data that you used to estimate that
2 equation, was it aggregate data or micro data the way
3 EPRI uses it cross-sectional?

4 A. For the "other" category?

5 Q. Yes.

6 A. It was aggregate consumption for the
7 other category versus the various explanatory
8 variables, so it's aggregate. It's not a forecast of
9 TVs, a forecast of lighting, a forecast of secondary
10 heaters; it is a forecast of the aggregate of that
11 grouping of appliances.

12 Q. In your equation, when you put in the
13 number of rooms, is that your average number of rooms
14 system-wide?

15 A. It's the average number of rooms for
16 single-family dwellings covering the four types of
17 single-family dwellings within REEPS, which primarily
18 is single detached homes.

19 Q. Is there a difference between using
20 cross-sectional analysis of the data and using the
21 aggregate annual average data that you used?

22 A. What we wanted to do was to use
23 Ontario-specific data because that is what we had and
24 what we had was aggregate data.

25 Certainly by using aggregate data, what

1 that allows you to do is, with an end-use approach
2 there is always going to be some end-uses that you do
3 not do an accounting for, especially in the future
4 because there will be other appliances, other uses that
5 currently aren't in existence.

6 A good example are VCRs. They took over
7 the market within about a 7-year period, and it would
8 have been very surprising 20 years ago that there would
9 have been so many VCRs out there. By doing it in an
10 aggregate way, we are trying to, in essence, take care
11 of some of these other categories without being able to
12 specify them directly.

13 Q. And then, you do your analysis by
14 comparing those annual averages over a period of time?

15 A. Those annual...?

16 Q. In your equation, you look at your
17 annual averages for each year over a certain period?

18 A. That's right.

19 Q. And is there a methodology - which I
20 am advised there is - of looking at one year's set of
21 data and then comparing different houses within that
22 data set to try from that to estimate differences in
23 consumption and usage patterns?

24 A. Within the "other" category or within
25 any end-use?

1 Q. Firstly, within any category.

2 A. Oh, within any end-use, certainly,

3 and that's why we use the data from the Residential
4 Audit Study which is a totally separate study where we
5 did take account for different types of houses.

6 Q. And is that possible to do that same
7 type of analysis with the "other" category or because
8 it's residual is it simply not possible?

9 A. For some of the end-uses it could be
10 useful. Lighting, for example, because that would be
11 related to the size of the house, single detached homes
12 are usually larger than row houses, from that respect
13 you would -- that further differentiation would be
14 potentially worthwhile. But as far as things like TVs
15 go, if you have got a TV in a house, whether it's a
16 semi or an attached, you have a TV in a house, I am not
17 sure you really gain that much.

18 Q. And have you compared the
19 elasticities that result from this equation with those
20 generated by the EPRI's parameters?

21 A. I don't have the details. The
22 elasticities are generally in the range of the
23 elasticities we found from a number of sources, but
24 what you will find with elasticities is that there is
25 usually a very wide range of results according to who

1 you speak to.

2 For example, I believe EPRI estimated
3 that the long run price elasticities would range from
4 minus .1 to minus 1.42, and our elasticities are within
5 that range.

6 Q. My question was a little bit
7 different, and perhaps it's my fault. I am told that
8 the EPRI values for the coefficients were significantly
9 different than the ones you have come up with in the
10 other category.

11 A. That certainly could be true. So we
12 are still talking "other" as opposed to --

13 Q. Yes.

14 A. We specifically used Ontario data and
15 estimated different equations, so...

16 Q. Did you make any comparison to the
17 EPRI coefficients for that category to see whether
18 there was some conclusion you could draw, comfort or
19 otherwise?

20 A. I cannot answer that question. I am
21 not sure exactly how much comparison was done.

22 Q. I am advised that in the EPRI model
23 there is a significant price variable. Have you given
24 any thought to why that doesn't appear in your
25 equation?

1 A. All I can say is based on Ontario
2 data, the price variable was not significant. I will
3 also say that if we had used EPRI's coefficients for
4 some of the other end-uses, we would have a tremendous
5 amount of oil water heating in this province and
6 everybody would be giving up their dishwashers.

7 I try to reproduce Ontario data, not
8 necessarily follow a U.S. model.

9 Q. But isn't it fair to say that the
10 EPRI values can give you some point for comparison?

11 A. That's right, but it does do not
12 necessarily mean they should be an indication of the
13 correct answer.

14 Q. Let's leave space heating aside,
15 that's not in the other category is it?

16 A. Oh, no, it's not.

17 Q. Is there anything intrinsic to the
18 category of other which you can think of in which
19 Ontario would have some different characteristic from
20 the data set used by EPRI that would account for the
21 distinction?

22 A. One of the things you have to realize
23 when you do a cross-sectional estimation is that that's
24 very much tied to what your electricity prices are in
25 your market. The relative electricity prices, et

1 cetera, in this market are different than the U.S.
2 situation. I am not sure necessarily why those
3 coefficients and that behaviour should indicate the
4 behaviour in this province.

5 Q. Have you looked into the question at
6 all other than the answer you have given me, have you
7 or your staff made any analysis of why the point of
8 different between you and EPRI on a category that
9 accounts for 73 per cent of your growth over the next
10 25 years?

11 A. If we used EPRI's equations, we would
12 not reproduce our historical data. I feel that's an
13 indication, that we might be suspicious to use that
14 equation to underlie our forecast.

15 MR. BURKE: A. I might just add that one
16 of the situations in the U.S. is that in using a
17 national sample, they have quite a bit of variation in
18 prices across the United States to work with, whereas
19 for the Province of Ontario there is one price regime
20 in effect and although the retail prices differ a
21 little bit from one municipal utility to another, it's
22 not really a very significant difference across
23 Ontario.

24 So, that in doing cross-sectional
25 analysis, were we to have done that, which we didn't,

1 we would not have expected to find much price
2 variation. It's something that the EPRI study was able
3 to find given its particular situation.

4 Q. So, is the nub of that, Mr. Burke,
5 that you are not using a variable because historically
6 you haven't found that it made a difference and it is
7 now out of the model we use for projecting the future?

8 A. Dr. Buja-Bijunas can talk to what was
9 done in the model, and I think she has already told you
10 that it was not statistically significant for Ontario.

11 What I was just describing was
12 hypothetically why, in the U.S., they could conceivably
13 have found a relationship which if we had tried to do
14 the same thing here we would perhaps not find.

15 Q. All right. Just lastly on this
16 topic, would it be fair to say that the short-run own
17 price elasticity should always be smaller in magnitude
18 than a long-run price elasticity?

19 DR. BUJA-BIJUNAS: A. Where are you
20 looking?

21 Q. In residential.

22 A. Are you referring to consumption
23 elasticity, UEC elasticity or saturation elasticity?

24 Q. Just a general statement. Is it fair
25 to say that in the residential sector the short-run own

1 price elasticity should, as a rule, be smaller in
2 magnitude than the long-run price elasticity?

3 A. Generally the smaller or equal since
4 there is less time to respond. There is less options.

5 Q. As a rule we tend to see responses to
6 price over some considerable period of time?

7 A. As a general rule.

8 Q. And if I could refer you, Doctor,
9 please, to the interrogatory you mentioned at the very
10 outset, 1.12.30. Do you have that, Doctor?

11 A. Yes, I do.

12 Q. I want to look firstly under the
13 middle column, UEC short-run/long-run?

14 A. Got it.

15 Q. That's unit energy consumption?

16 A. That's right.

17 THE CHAIRMAN: Just a moment, please. I
18 haven't yet got 1.12.30. Whose interrogatory was that?

19 MR. MARK: That is one of Consumers'
20 Association of Canada.

21 ---Off the record.

22 MR. MARK: Mr. Chairman, I am on table 1
23 of that interrogatory, under the middle column, unit
24 energy cost.

25 DR. BUJA-BIJUNAS: Consumption, not cost.

1 MR. MARK: I'm sorry, consumption. My
2 apologies.

3 Q. This interrogatory, Doctor, deals
4 with price elasticity?

5 DR. BUJA-BIJUNAS: A. That's correct.

6 Q. And if we look at the row for heat
7 pump air conditioning--

8 A. That's correct.

9 Q. --am I correct that you see a greater
10 elasticity in the short-run than in the long-run, minus
11 .3 as opposed to minus .2?

12 A. That's correct.

13 Q. And have you considered whether that
14 appears accurate and whether there is any explanation
15 for that?

16 A. There are two considerations, one of
17 which is, by the time you get to the heat pump numbers,
18 it's not a very large sample. So, there will be some
19 variations in the results due to the model.

20 REEPS is a micro simulation so you
21 produce samples of household decision-makers. For
22 end-uses or appliances where there isn't necessarily a
23 very large sample you might have some variation.
24 That's a small consideration. ...

25

1 [3:35 p.m.] The major consideration I would point to
2 is the fact that these elasticities to a large extent
3 reflect the composition of new housing within the
4 entire housing stock. The relative contribution of the
5 new housing is less in the short-run than it is in the
6 long-run.

7 Q. I'm sorry, what has that got to do
8 with this figure?

9 A. Let me put it this way. If there
10 were no new houses built, we just had the existing
11 stock, okay?

12 Q. Yes.

13 A. If I changed price by 10 per cent,
14 the only difference would be the existing houses and
15 how much they change, okay.

16 If I build new houses that have a
17 different unit energy consumption, if 10 per cent of my
18 stock suddenly is made with new houses, the response
19 will be different because your base that you are trying
20 to find the elasticity of is made up of new and
21 existing houses. So, a lot of these elasticities when
22 we adjusted it for new housing, compared to total
23 stock, were very different results because of the
24 influence of new stock on your total aggregate.

25 Q. Let me make sure we understand what

1 was done here. As I understood what this exercise that
2 you were asked to do in this interrogatory entailed,
3 was doing one run of your model at one price, maybe the
4 assumed price?

5 A. That's right.

6 Q. Taking the same model, the same data,
7 the same stock mix--

8 A. That's right.

9 Q. --and all of that and the same number
10 of new homes--

11 A. Yes.

12 Q. --and running the model assuming an
13 increment to price?

14 A. That's certainly the case. That's
15 right.

16 Q. So, maybe I just don't understand the
17 process. But you don't have the mix in the housing
18 stock as a variable in this; it is a constant?

19 A. Certainly not. You are trying to
20 find elasticity. What I am saying is that these
21 elasticities, if we had a different construction
22 forecast, would be different. These elasticities are
23 dependent on our forecast of new construction and their
24 weighting in the total stock.

25 To the extent that that percentage

1 weighting is different in the short-term and the
2 long-term, we have different results. I am saying to
3 get a really good feel for what the model is doing,
4 what REEPS is really doing, not the Ontario situation,
5 what REEPS is really doing, you should look at new
6 stock elasticities because they will not be offset by
7 their weighting in total stock.

8 Q. And what is it about heat pump
9 air-conditioners that is subject to this vagary because
10 of your housing mix that we don't find with central
11 air-conditioning or room air-conditioning or any other
12 number of appliances we have looked at.

13 A. I can't answer that directly. I
14 would have to look at each of the factors individually.

15 Q. Let's look under the first column
16 "saturation"; and indeed the first entry furnace heat.
17 We see there a greater short-run elasticity than
18 long-run. See that?

19 A. Yes, I do.

20 Q. And have you given any thought to why
21 that appears?

22 A. What I am saying is that when you do
23 the same elasticities for new housing because that's
24 the only relevant elasticity. Saturation reflects
25 decision making and choices and it is in new housing

1 where you make decisions.

2 Certainly if prices change a small
3 amount, people don't throw out their furnaces which
4 might be a year or two old. Existing housing is much
5 more sluggish than new decisions.

6 If you really want to see what REEPS is
7 saying, I think you should be looking at elasticities
8 for new housing with the short-run result versus the
9 long-run result. Not total stock which gives a
10 weighted result based on how important the new stock is
11 versus the existing stock.

12 If the existing stock is different or has
13 a different behaviour compared to the new stock, the
14 relative contribution will give you a different
15 elasticity.

16 Q. Is it fair to say that price
17 elasticity in new homes is greater than in existing
18 homes?

19 A. For saturation? For saturation,
20 which...

21 Q. Generally. As you have said, in new
22 houses where you have the opportunity to make the
23 choices. Is that fair?

24 A. Pardon me? Yes, yes. That's right.

25 Q. So, can we conclude from that that

1 you are going to see greater elasticities in your new
2 housing figures?

3 A. Not necessarily. The elasticity with
4 respect to price, you can make more decisions but it
5 isn't necessarily that the decision makers will be more
6 price sensitive, they might be more sensitive to income
7 or other parameters. I am saying there is more
8 decision making taking place for new homes than people
9 who are sitting on their furnaces.

10 Q. They can't be less price elastic than
11 existing homes? If anything, they are the same or
12 more; is that fair?

13 A. I wouldn't necessarily agree with
14 that, I guess.

15 Q. I don't want to go at this too much.
16 But I understood from your answer that it is in the new
17 housing stock that owners, builders, whoever we are
18 talking about, the decision makers, have the
19 opportunity, more than with existing homes, to respond
20 to price?

21 A. I better rephrase that. They have
22 more opportunity to make choices. Their choices may
23 not be as price sensitive, they might be in income
24 levels where they are less price sensitive, but they
25 have that opportunity to choose and buy something and

1 install it.

2 Q. But would it not be fair to say they
3 are certainly not going to be less price sensitive than
4 the existing housing stock?

5 A. I can't answer that without seeing
6 the results.

7 Q. And just finally, I mean you said we
8 did have to look at other figures, income et cetera, to
9 really be able to figure this out.

10 A. Yes.

11 Q. Do I have the point correctly?

12 This sensitivity run that you did assumes
13 the constancy of all the other variables.

14 A. This sensitivity run allows -- no.
15 You run the basic forecast; in other words, you run the
16 model the way it is normally set. And then we
17 increased prices by 10 per cent but we allowed all the
18 variables to change the way they normally do.

19 Q. But the only change you put into the
20 model here for the sensitivity run--

21 A. Is the price.

22 Q. --is the increase of the price?

23 A. That's right, yes.

24 Q. All right. So, that's the point of
25 the sensitivity analysis. We don't have to concern

1 ourselves overly with whether the decisions we are
2 seeing reflected in this interrogatory were in fact
3 caused by income changes or other variables. Isn't
4 that the object of the exercise?

5 A. What I am saying is that when you do
6 two runs like that, you subtract A from B, that
7 difference will be influenced by how much new housing
8 you have in there. That new housing currently, for
9 example, has an extremely high marginal rate brought
10 about by non-price effects. That is the historically
11 measured data.

12 Q. With respect, Doctor, you haven't
13 answered my question. Can we establish one thing, the
14 only thing that is changing when you do this
15 sensitivity analysis is price?

16 A. The only two differences in this
17 scenario is price. Subtracting A from B does not just
18 give the price effect because it also gives -- if you
19 subtract A from B, you will get a different result if
20 your basic forecast was different.

21 Q. Let me move, Doctor, please --

22 THE CHAIRMAN: If you are moving to
23 another point, we will take the afternoon break.
24 Fifteen minutes.

25 ---Recess at 3:45 p.m. ...

1 ---On resuming at 4:00.

2 MR. MARK: Thank you, Mr. Chairman.

3 Q. Despite what I said just before the
4 break, Dr. Violette reminds me that there is one matter
5 which I omitted to deal with on the residential model.
6 So, Doctor, I'm going to take you back to that just for
7 a moment.

8 DR. BUJA-BIJUNAS: A. Sure.

9 Q. Continuing with the document we were
10 were looking at, which is table 1 in the Response to
11 Interrogatory No. 1.12.30, am I correct that that shows
12 the overall long-run elasticity is minus .27?

13 A. Oh, I see. Energy consumption,
14 long-run elasticity. That is right, .27.

15 Q. And isn't that a number which is
16 quite low compared to other studies?

17 A. That number is within the range of
18 other studies that we found.

19 Q. And you don't find it unusually low?

20 A. It is consistent with the range of
21 other studies that we found.

22 Q. Is it at the low end of the range?
23 Would that be fair to say?

24 A. I can't really answer that question.
25 I have a range in front of me, but it is a matter of

1 how many studies aggregate within the range. The whole
2 range might be from zero to one, but if most of the
3 results are at the lower end, I can't say where we
4 stand.

5 Q. What was the comparable elasticity
6 found by the residential econometric model?

7 MR. BURKE: A. I'm just looking that up,
8 if you give me one moment.

9 It is minus .51.

10 Q. And is that not a significant
11 difference?

12 A. Yes, it is a difference, but these
13 are estimated in a completely different manner, and
14 there are many other things going on in the end-use
15 model that are going on in the econometric model. I
16 don't think it is valid to compare these from the
17 perspective of how a forecast would evolve in the
18 future.

19 The end-use model will respond to many
20 other things than the econometric model will, and so
21 there may be affects rolled up in price here that are
22 captured in other ways in the econometric model -- in
23 the end-use model.

24 Q. Now, Doctor, let me turn to the
25 commercial sector forecast. The energy relationship in

1 the commercial sector, am I correct, is a function of
2 the amount of floor space, the share of floor space
3 using each fuel type, and the energy consumption of
4 each equipment type?

5 DR. BUJA-BIJUNAS: A. That is correct.

6 Q. So, therefore, in general, you need
7 information on three variables. That is floor space,
8 fuel share and the EUI?

9 A. That is correct.

10 Q. And that is the energy utilization
11 index?

12 A. That is correct.

13 Q. And the elasticities in your COMMEND
14 model, are those the default values provided by EPRI?

15 A. No, they are not. We again found
16 that the EPRI default coefficients did not reproduce
17 Ontario data, so we altered coefficients appropriately.

18 Q. If you will just give me a moment,
19 please.

20 A. I must say that a number of the
21 coefficients we altered, we did that by discussing the
22 behavioural problems with the developer of the model,
23 who recommended the changes.

24 Q. I am sorry, I didn't quite catch
25 that.

1 A. A number of the changes that we
2 implemented in the COMMEND model, not only the
3 historical values -- not only were they inconsistent
4 with what COMMEND was forecasting, we consulted with
5 the developer of the model, and he agreed some of the
6 coefficients were not reproducing results and were
7 probably incorrectly estimated. So, we did not do that
8 in isolation.

9 Q. I know I didn't refer you to this in
10 the list I provided to you earlier, Doctor, but if you
11 have it handy, please, could you turn up Interrogatory
12 Response 1.9.32?

13 MR. MARK: My apologies, Mr. Chairman. I
14 didn't expect to be referring to it.

15 MS. PATTERSON: We don't have it.

16 MR. MARK: You won't have it, so I will
17 ask you just to bear with me, and I will do my best to
18 explain the document as fully as I can.

19 Q. Do you have it, Doctor?

20 DR. BUJA-BIJUNAS: A. Yes, I do. You
21 said 1.9.32.

22 Q. That is right.

23 A. Right.

24 Q. For the record the question was:
25 "Please provide support for the

1 elasticity estimates used in Ontario
2 Hydro's implementation of the COMMEND
3 model, including technological
4 elasticity, choice elasticity and
5 utilization elasticity."

6 And I'm reading, in the Response, it

7 says:

8 "COMMEND 2.1," which is the reference
9 to the COMMEND version that you used,
10 "requires elasticities representing
11 decision makers responses to changes in
12 fuel price. These elasticities
13 correspond to three specific decisions:
14 Choice of technology, i.e., efficiency;
15 choice of fuel, and utilization of the
16 technology. All the elasticity estimates
17 used in the Ontario Hydro implementation
18 of the model were those that were
19 developed by EPRI and supplied as default
20 values."

21 A. Okay, this refers to COMMEND 2.1.

22 Q. Yes.

23 A. We currently use COMMEND 3.2, which
24 is structured somewhat differently. I was referring to
25 the 1990 forecast.

1 Q. Here is my difficulty, Doctor. This
2 question was received by Ontario Hydro on November the
3 20th of 1990. Which version were you using then?

4 A. As I said, I said:

5 "From the wording of the question, it
6 is assumed that COMMEND Version 2.1 is
7 referred to."

8 Q. Yes.

9 A. Because you wanted to know what
10 particular elasticities were in place. Those
11 particular ones underlie COMMEND 2.1. So, the response
12 consistent with the question was given.

13 Q. Hold on a second.

14 As of November the 20th, 1990, were you
15 using COMMEND Version 2.1, or the COMMEND Version 3.1?

16 A. 3.2.

17 Q. 3.2.

18 A. The 1990 forecast was reduced using
19 COMMEND 3.2.

20 Q. So the 1990 forecast was based on
21 COMMEND 3.2.

22 A. That is correct.

23 Q. We asked you in interrogatory to
24 explain the elasticities, and you gave us the
25 elasticities underlying the version of the model which

1 you didn't use in your 1990 forecast.

2 MR. B. CAMPBELL: Just a minute. At that
3 time...

4 MR. MARK: Sorry, let's find out if it is
5 correct.

6 MR. B. CAMPBELL: Just a minute.

7 THE CHAIRMAN: Just a minute, Mr.
8 Campbell. Please, please; anything that is said should
9 be said through the panel.

10 I think the question should be answered,
11 and then if you have got some comments to make, you
12 can. I think the question was a quite simple one from
13 Mr. Mark, and that was the answers to this particular
14 interrogatory were given with respect to the earlier
15 model, is that right? That they were given with
16 respect to the earlier model, the model that you were
17 not then currently using.

18 DR. BUJA-BIJUNAS: The question more
19 directly...

20 THE CHAIRMAN: No, no, just answer that
21 particular question.

22 DR. BUJA-BIJUNAS: Yes.

23 THE CHAIRMAN: All right. Now, Mr.
24 Campbell, what is the problem about that.

25 MR. B. CAMPBELL: Well, I just want to

1 make it clear, Mr. Chairman that the 1990 forecast, my
2 friend's question seems to assume that the 1990
3 forecast was out at that time. You will recall that it
4 was not published until much later.

5 THE CHAIRMAN: We know it didn't come in
6 till January.

7 MR. B. CAMPBELL: As long as it was
8 clear. To my submission the question was misleading in
9 that it didn't make that clear.

10 MR. MARK: Q. Doctor, the question...

11 THE CHAIRMAN: I think I was able to
12 follow it, Mr. Campbell.

13 MR. MARK: Q. The question reads:
14 "Please provide support for the
15 elasticity estimates used in Ontario
16 Hydro's implementation of the COMMEND
17 model."

18 Now wouldn't it be fair to assume -- did
19 you assume we were asking for the elasticities
20 underlying a model in a forecast which hadn't even been
21 published?

22 DR. BUJA-BIJUNAS: A. No, I assumed you
23 were specifically asking for technological elasticity,
24 choice elasticity, utilization elasticity, which were
25 the three main elasticities of COMMEND 2.1. And

1 because COMMEND 2.1 underlies the 1988 forecast, I
2 assumed that is what you are referring to.

3 COMMEND 3.2 is under development. We
4 used it for the 1990 forecast, and the underlying
5 assumptions are being developed in close co-operation
6 with the current developer of COMMEND. That is where
7 the difference lies.

8 Q. Can you give us those three
9 elasticities that underlie or are part of COMMEND 3.2?

10 A. There are a number of additional
11 elasticities. It is not quite defined the same way.
12 The new COMMEND 3.2 versus the old COMMEND 2.1. The
13 old COMMEND 2.1 was done a more simplistic way, and so
14 certain parameters took the burden of a number of
15 things. The new COMMEND 3.2 is more disaggregated, and
16 so it is an apples and oranges issue.

17 THE CHAIRMAN: So I take it the answer is
18 you can't give him the same figures for the 3.2.

19 DR. BUJA-BIJUNAS: That is right, yes.

20 MR. MARK: Q. Is there documentation
21 available on COMMEND 3.2 from which we could determine
22 what the elasticities are that are used in the values?

23 DR. BUJA-BIJUNAS: A. There might be a
24 users manual of COMMEND 3.1, because 3.2, I don't
25 believe, has been issued yet. It is still in

1 development stage. I think 3.1 is, but I'm not sure if
2 we can release that, if EPRI is under copyright.

3 THE CHAIRMAN: Let me just make sure I
4 understand this. You are saying that the 1990 forecast
5 was based on this program, 3.2. Which is in the
6 development stage?

7 DR. BUJA-BIJUNAS: That is correct.

8 MR. MARK: Q. I was just going to ask
9 that. It hasn't been released for use by EPRI then?
10 Or has it been?

11 DR. BUJA-BIJUNAS: A. COMMEND 3.1 has
12 been released by EPRI, but COMMEND is undergoing a lot
13 of changes, ongoing changes, almost on a monthly basis.
14 In fact, I think they are on COMMEND 3.3 at this stage.
15 And consequently, since it is evolving so quickly, they
16 aren't necessarily coming to the, you know, here is
17 full documentation, on to the next stage. There is
18 some in-between versions of the model, which various
19 people are using. And since we are involved with them
20 in this development work, we used a version which may
21 not be available for wide release.

22 Q. Are most of the changes in the new
23 version, let's say 3.2 versus 3.1, are those relatively
24 minor changes?

25 A. Not really. One of the things that

1 2.1 did was it only really modelled space heating. The
2 heating component of HVAC, whereas COMMEND 3.2 models
3 all the end-uses. So, there are some differences, some
4 very major differences between the two codes. I'm
5 sorry, I am sorry.

6 MR. B. CAMPBELL: Was the question 3.1
7 and 3.2, or 2.1?

8 MR. MARK: Q. I'm talking about
9 comparing 3.1 to 3.2.

10 DR. BUJA-BIJUNAS: A. I am sorry, I
11 heard 2.1. 3.1, 3.2, it is a matter of level of
12 detail.

13 THE CHAIRMAN: Matter of what? I am
14 sorry.

15 DR. BUJA-BIJUNAS: Level of detail. 3.1,
16 3.2 follow the same structure, which is very different
17 than 2.1.

18 MR. MARK: Q. Is 3.1 a model which is,
19 let's say, issued for release, or is it something which
20 is...

21 DR. BUJA-BIJUNAS: A. It is available at
22 the EPRI Software Development Centre.

23 Q. Do I take it from your previous
24 answers, according to your understanding, 3.2 is not
25 yet available?

1 A. I'm not sure if it is available or
2 not. The last I asked, a few months ago, only 3.1 was
3 available for issue.

4 Q. How did you get 3.2?

5 A. We are in a contract with EPRI to do
6 development work for REEPS and COMMEND, to bring those
7 models quite significantly beyond where they are right
8 now. Since we are in this contract situation, as they
9 develop these models, we get them, and we test them out
10 and give back feedback.

11 Q. So, the model which underlies your
12 latest forecast is the one which EPRI considers to be
13 still under development, is that fair?

14 A. Which we consider to be still under
15 development. EPRI is quite close to issuing it.

16 Q. Are there default values in the 3.1
17 and 3.2?

18 A. Yes, there are.

19 Q. And you gave us, in response to some
20 of our interrogatories, the answer that you couldn't
21 release the default values, because you considered
22 them, or EPRI considered them to be proprietary. Do
23 you have the same concern? ...

24

25

1 [4:20 p.m.] A. Yes. We got in contact with them to
2 ask them if we can Xerox some of these documents and
3 they recommended that people contact them directly as
4 opposed to our Xeroxing or reproducing the documents.

5 MR. MARK: Mr. Chairman, I am not sure
6 what the correct procedure is, it's news to us about
7 the COMMEND 3.1 or 3.2 underlying the forecast. The
8 best I can do at this point is say I am going to have
9 to consider it, and of course I will do that as soon as
10 possible. I may come back before you in the next day
11 or few days and indicate that I may seek leave to
12 direct some further questions to this panel. I am just
13 not in a position to deal with that issue today.

14 Q. Let's move on a bit, Doctor. The
15 model baseline for the 1990 forecast, that's the 1986
16 year, is it?

17 DR. BUJA-BIJUNAS: A. I would like to
18 make one comment. The documentation did explicitly say
19 COMMEND 3.2 was used. Page 37.

20 MR. BURKE: 36 in everybody else's.

21 THE CHAIRMAN: Which exhibit, Mr. Burke?

22 MR. BURKE: Exhibit 9.

23 MR. MARK: Q. Sorry. Exhibit 9, which
24 is the load forecast? That's the load forecast report?

25 MR. BURKE: A. That's correct, it's the

1 one where we are one page off. I think it is page 36,
2 though. It's Section 4.2, first sentence.

3 Q. I am told it is our page 38, Section
4 4.2. "This year a PC-based version of the COMMEND
5 model 3.2 was used to conduct the building-related
6 portion of the commercial sector energy forecast."

7 This document is dated December 1990,
8 correct, Mr. Burke?

9 A. That's correct.

10 Q. I will just point out for the record,
11 Mr. Burke, that in the Exhibit 17, it says on Section
12 1.0, the introduction, it simply says, "This year a
13 PC-based version of the COMMEND model was used to
14 conduct the energy forecast," but --

15 DR. BUJA-BIJUNAS: A. That is because
16 COMMEND 2.3 is mainframe, COMMEND 3.2 is PC. People
17 familiar with COMMEND would know right away, PC must
18 mean something different than COMMEND 2.1.

19 Q. So, the load forecast 90/12/10, is
20 that in any sense related or is it an input to the work
21 which -- well, I take it it's rather integrally related
22 to work that we see in Exhibit 17.

23 A. It's the same thing, it is just a
24 slightly shorter summary, but it's the same thing.

25 Q. So the forecast you are now using

1 based on model 3.2--

2 A. That's right.

3 Q. --is not reflected in Exhibit 17, or
4 is it?

5 A. No, it's the same thing. The
6 forecast in Exhibit 17 is the same as the forecast in
7 Exhibit No. 9. Both of them are the same forecast
8 produced with COMMEND 3.2.

9 Q. All right. Doctor, let me go to the
10 question I was asking a few moments ago. The model
11 baseline for the 1990 forecast was the 1986 year; is
12 that correct?

13 A. For the commercial sector?

14 Q. Yes.

15 A. That's correct.

16 Q. And the numbers for 1988, 1989 and
17 1990, are those estimates made from the base year?

18 A. What we did is that we baselined
19 1986, but we were aware of the '87 and '88 and '89
20 numbers, so we incorporated those results in the
21 finalization of the model.

22 What you can do with the model is that
23 you can just baseline it for one year or you can take a
24 few years into consideration and try to calibrate the
25 model so that it more or less trends those few years

1 and that, basically, was more the approach.

2 Q. And as I understand your
3 documentation, you get your information on floor space
4 generally from three sources. Let me summarize and
5 tell me if you think that is correct. Firstly, you get
6 one group of data from your own surveys, some floor
7 space information you get from your own surveys?

8 A. That's right.

9 Q. And that's principally for multi-res
10 and offices?

11 A. That's correct.

12 Q. The second from governmental
13 ministries and those groups, I believe, are schools,
14 universities, health and government services?

15 A. That's correct.

16 Q. And there is a third group which, I
17 believe you say in your documentation, is based on
18 other sources and estimates based on number of
19 employees and those groups are retail, accommodation,
20 recreation, religious, warehouses and miscellaneous?

21 A. That's correct.

22 Q. And this third group that I just
23 described accounts for approximately 34 per cent of the
24 square footage that we are dealing with in aggregate?

25 A. Could you repeat those categories

1 again?

2 Q. Yes. Retail, accommodation,
3 recreation, religious, warehouses and miscellaneous.

4 A. I guess I would defer to Mr. Rothman
5 if he has got his floor space numbers in front of him.

6 MR. B. CAMPBELL: While they are looking,
7 I trust that the transcript will put a comma between
8 religious and warehouses. (Laughter)

9 MR. MARK: We will leave the value
10 judgments to the readers, I guess.

11 DR. BUJA-BIJUNAS: What were the
12 categories, again, please? Retail, accommodation--

13 MR. MARK: Q. Recreation, religious --

14 DR. BUJA-BIJUNAS: A. Warehouses.

15 Q. Yes, and miscellaneous.

16 A. Yes, it's around 30.

17 Q. And by my calculation, that group as
18 well accounts for approximately 42-1/2 per cent of the
19 building energy use?

20 A. Are you referring to the total
21 commercial sector or building-related demand?

22 Q. Building-related demand.

23 A. What percentage did you get?

24 Q. I got approximately 42-1/2 per cent.

25 A. That's about right.

1 Q. And what are the other sources from
2 which you derive your estimates for these categories?

3 A. What other sources were used to
4 determine floor space?

5 Q. Yes, for those categories.

6 A. I would have to again defer to Mr.
7 Rothman, he directs that work.

8 MR. ROTHMAN: A. Are you asking where do
9 we get the historical data from which we estimate the
10 forecast or where we get the forecast?

11 Q. I am assuming you derive your own
12 forecast from some historical data, or do you take
13 somebody else's forecast?

14 A. No, we derive our own forecast.

15 Q. All right. So, my question is,
16 contrasted with those other categories where you did
17 your own surveys or you rely on governmental
18 ministries, what are your information sources for this
19 Group 3, as I call it?

20 A. Let me see if I have that information
21 in my notes. I don't think that I do, at that level of
22 detail.

23 DR. BUJA-BIJUNAS: A. CANADATA is
24 another source that we use for new building additions.

25 Q. That source that you referred to,

1 Doctor, is that some --

2 A. CANADATA?

3 Q. Yes.

4 A. It's a large organization which
5 provides floor stock additions and fuel share
6 information for new construction.

7 Q. Does one have to subscribe to that?

8 A. Yes, that's right.

9 MR. ROTHMAN: A. I don't find
10 information on the data sources within my material.
11 Again I can consult and I am sure get that information.

12 Q. If you would, Mr. Rothman.

13 Is it fair to say, from what you
14 understand now, that most of the forecast is derived by
15 using number of employees?

16 A. The forecast?

17 Q. Yes, for the square footage?

18 A. For the commercial sector, no, that's
19 not true.

20 Q. What about the historical data, do
21 you develop that on a square foot per person basis?

22 A. I think that it would be fair to say
23 here, Mr. Mark, that for the historical commercial
24 square footage data, we use other sources and we would,
25 for some sectors, look at a computed square foot per

1 person number as a consistency check or as a reality
2 check. Or just to see what those data are saying. But
3 we don't do it the other way around; that is, we don't
4 start with floor space per person number and build up
5 either the history or the forecast from that direction.

6 Q. This third group that I have been
7 speaking about, the one with retail accommodation, et
8 cetera, is it fair to say that is generally somewhat
9 more difficult to estimate than the other two groups
10 where you do your own surveys or have governmental
11 information you consider reliable?

12 A. I think I was being reminded to ask
13 what you mean by how easy it is to forecast, and the
14 answer I was going to give anyway was to say, let me go
15 back and just talk a little bit about how we do these
16 commercial floor space forecasts. I know that we have
17 answered some interrogatories on this question, and
18 again I don't have those numbers off the top of my
19 head, but again we would look to find them and give
20 them to you at a later time.

21
22
23
24
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...

1 [4:35 p.m.] Each of these commercial sectors is
2 estimated by a single equation regression model, and
3 those single equation models are specifically built for
4 each sector. What's on the right-hand side of those
5 models, that is, which variables we view as explanatory
6 in those models, really depends on what looks good when
7 you do the forecast -- sorry, what looks good when you
8 estimate the equation and what we have available as
9 forecast variables.

10 So, as we go along in time, we do change
11 these -- we change this specification of those
12 equations and we get better estimations. But, in any
13 case, it is clear -- well, I shouldn't say it's clear.

14 In any case, estimating something like
15 square footage of warehouse space in Ontario in 2010 is
16 not likely to be the kind of exercise to which you
17 think that you can find a single equation and just
18 trust whatever that equation produces, based on
19 whatever has happened in the last 20 or 25 years in
20 that variable.

21 So, we do put some judgment into those
22 forecasts based on the way we view the demographic
23 trends and sociological trends within Ontario.

24 So, to go back to where your question
25 came from, do we view those as easier to forecast? If

1 we want to use as a criterion whether or not we feel we
2 have to make adjustments to the forecasts that come out
3 of those equations - here is the big anticlimax - I
4 don't know off the top of my head, but I do have some
5 information here and I could just give you a
6 run-through of that if you like.

7 Q. My point was actually a little bit
8 different. You have dealt with the right-hand side of
9 the equation.

10 The left-hand variable is the historical
11 floor space for each building type; is that correct?

12 A. Yes. Well --

13 Q. And the quality of your forecast
14 using these equations, I assume, is rather strongly
15 related to the quality of your historical data?

16 A. The quality of the forecast, yes.

17 Q. And is it fair to say that you have
18 greater difficulty in getting good data on this, what I
19 call the third group of uses, than you do the other
20 two?

21 A. I don't know that it's fair to say
22 that, Mr. Mark. The best information that I currently
23 have is that we get most of it in at roughly similar
24 levels of reliability. But, again, we can check that.

25 Q. Please do.

1 I would have thought, Mr. Rothman, that
2 secondary sources would be less reliable than your own
3 survey; would that not be a fair generalization?

4 DR. BUJA-BIJUNAS: A. One of the things
5 that you are overlooking, I think, is the nature of the
6 type of building segment you are trying to forecast.
7 The office segment is very, very large in terms of
8 square footage, but what we have found is that even
9 historical data is hard to obtain because it's actually
10 hard to define what is office space.

11 There are a lot of buildings which are
12 multi-use buildings which have office space in the top
13 ten floors and have a restaurant and have a tuck shop
14 and shoe repair shop, all sorts of other things on the
15 main floor. Often the entire building is reported as
16 office space when it really isn't. Sometimes when a
17 building is reported as office space, 80 per cent of
18 the space is office or 60 per cent of the space is
19 office or 50 per cent of the space is office.

20 Different people use different criteria
21 to establish what is office space and include that
22 number in their floor space total footage. Because of
23 that, we found, in doing the survey, that if you have
24 two different surveys, you have two different sources
25 of information, you will have two different estimates

1 based on how they defined that space.

2 Q. So, even in your biggest sector
3 office space, there are some significant difficulties
4 in gathering your historical data?

5 A. There is. But the one thing I will
6 say is that when we look at additions to space, we rely
7 heavily on CANADATA, so you are using one source across
8 all building types for some consistency in
9 interpretation.

10 But as far as historical office data
11 being easier to obtain than historical restaurant data,
12 I am not sure that's necessarily the case because it is
13 difficult to define that space.

14 Q. But let's be clear. The key to the
15 regression model is your historical data?

16 A. That's right.

17 Q. Let's move on to the question of fuel
18 share estimates by building type. Where do you get
19 this information?

20 A. It varies. We relied on a
21 combination of sources. We looked again at the
22 multi-residential and office surveys that you referred
23 to which were done by Ontario Hydro. We looked at
24 CANADATA which gives marginal fuel shares, and we also
25 contacted government ministries, like Education and

1 Health, I believe, to see what their estimates were for
2 fuel shares for their particular areas of
3 responsibility. So, we combined a number of sources to
4 get those results.

5 Q. And is the object of that exercise to
6 develop what you consider to be reasonable estimates of
7 the fuel share?

8 A. Reasonable estimates of the current
9 fuel share?

10 Q. Yes.

11 A. Yes.

12 Q. Do you know how the Ministry of
13 Energy compile their estimates, what database they use?

14 A. I, personally, am not aware of what
15 database they use, but it could be that the analyst in
16 my group responsible for this would know.

17 Q. You don't know whether it's anything
18 other than just asking the other ministries for their
19 estimates?

20 A. I know that the end-use modelling
21 effort is much smaller for the Ministry of Energy,
22 so...

23 Q. Smaller than yours?

24 A. No. What I mean is that the amount
25 of resources, the amount of time spent on it, is much

1 smaller due to resource limitations, so --

2 Q. Smaller than whose?

3 A. Ontario Hydro's.

4 I don't expect they have done extensive
5 surveys or anything like that.

6 Q. All right.

7 On the question of fuel shares, do you
8 have any historical time series data that goes back at
9 least ten years?

10 A. I would definitely say no to that.

11 The commercial sector as far as available data goes is
12 certainly the sector where data is the most sparse, and
13 I would say data for the commercial sector fuel shares
14 only goes back a few years or so; they don't go back a
15 very long time.

16 Q. So, for the purpose of your
17 regression modelling, how many years back are we going?
18 Three, four with historical data?

19 A. Which regression are you talking
20 about?

21 Q. I'm sorry. You may not --

22 A. Are you talking energy use? You're
23 talking fuel shares here?

24 Q. Yes.

25 A. There is no regression on fuel

1 shares.

2 Q. Okay, I'm sorry.

3 Let's move on to the last component of
4 this analysis which is the energy utilization index.
5 And is this also a compilation of information from a
6 variety of sources or do you have some survey or other
7 single source?

8 A. It is a compilation. The first set
9 of estimates we had were produced by a consultant by
10 the name of Middleton Associates, who produced EUI
11 estimates back in 1983 for the commercial sector. We
12 have those.

13 We also have some Xenergy audits, which
14 include not only Ontario Hydro, but a number of
15 northeast utilities. We use those as well as directly
16 contacting other utilities, so we basically compare to
17 a number of other utilities or other data sources.

18 Q. And again in general terms is the
19 goal to come up with an estimate that seems reasonable
20 and makes sense?

21 A. That's right.

22 Q. Let's turn, Doctor, to once again
23 that category called "Miscellaneous", but this time in
24 the commercial.

25 A. Are you referring to miscellaneous

1 building category or miscellaneous end-use? There are
2 two of them.

3 Q. By end-use. That category
4 includes -- does that include all the equipment which
5 you don't allocate to a specific category?

6 A. That's right. It's elevators and
7 rampway heaters and things like that.

8 Q. And including things that you don't
9 specifically have in mind?

10 A. That's right. That's right.

11 Q. And you have another category called
12 "Office Equipment"; is that correct?

13 A. That's correct.

14 Q. And what's the distinction between
15 "Office Equipment" and "Miscellaneous"?

16 A. The office equipment is specifically
17 PCs, minis, printers, Xerox machines, things related
18 with information transfer in the office.

19 Miscellaneous are things like elevators,
20 ramp heaters, any other use of electricity apart from
21 information-based type of uses.

22 Q. And does office equipment, similarly
23 to miscellaneous, also include within it appliances and
24 uses we may not particularly have in mind today but one
25 assumes may develop?

1 A. Indirectly, yes.

2 Q. Indirectly in the sense that simply
3 because you don't know what it is but it's intended to
4 capture that general increase in office automation?

5 A. That's exactly correct. Instead of
6 having an "Other" component to office equipment, we
7 have a growth in amount of office equipment per
8 employee. That sort of captures any other use of
9 office equipment.

10 Q. And would it be fair to say that your
11 "Miscellaneous" category and your "Office Equipment"
12 category are more difficult to forecast than the other
13 specific categories that you identify?

14 A. Yes.

15 Q. It's simply more uncertain than the
16 others; fair?

17 A. Not to assume that all the other
18 end-uses are trivial to do.

19 Q. Sorry?

20 A. Not to assume the other end-uses are
21 trivial to do.

22 Q. Are trivial to do?

23 A. To do.

24 Q. Oh, no, I am not suggesting that at
25 all. But this category clearly is more uncertain than

1 the others.

2 A. You can't point to part of it, yes.

3 THE CHAIRMAN: I am not sure I get the
4 distinction. There is a degree of uncertainty and
5 there is degree of difficulty in making the forecast.
6 Are they the same thing?

7 DR. BUJA-BIJUNAS: The nature of the
8 uncertainty is such that it ends up being more
9 difficult to define, and in that respect the
10 uncertainty leads to a difficulty.

11 MR. MARK: Q. Can we put it in simple
12 terms: less confidence in that forecast than in the
13 forecast of things like space heating, space cooling,
14 et cetera; is that fair?

15 Mr. Burke is nodding his head
16 affirmatively. If he could speak up, we can get on.

17 MR. BURKE: A. I can understand Dr.
18 Buja-Bijunas' concern about relative degrees of
19 difficulty in a sector where everything is difficult.
20 But I guess I was nodding my head yes, so...

21 MR. B. CAMPBELL: I have told them that
22 they are allowed to disagree with each other but only
23 occasionally.

24

25

...

1 [4:50 p.m.] MR. MARK: Q. I have provided you this
2 morning, Doctor, another exhibit, which is essentially
3 a copy of an excerpt from your documentation,
4 particularly page 42 of Exhibit 17.

5 THE CHAIRMAN: Will this be the next
6 exhibit?

7 MR. MARK: Yes, if it could, Mr.
8 Chairman.

9 THE CHAIRMAN: What number will that be?

10 THE REGISTRAR: 105, Mr. Chairman.

11 THE CHAIRMAN: Thank you.

12 ---EXHIBIT NO. 105: Copy of page 42 of Exhibit 9,
13 Table 4.2.2.

14 MR. MARK: Q. Do you have that, Doctor?

15 DR. BUJA-BIJUNAS: A. You are referring
16 to table 4.2.1?

17 Q. 4.2.2 actually.

18 A. Okay.

19 Q. Do you have that document, which I
20 provided to you through counsel this morning?

21 A. Oh, yes.

22 MR. BURKE: A. It is not from Exhibit
23 17. It is from Exhibit 9.

24 Q. Thank you. Yes, you are quite right.
25 Doctor, you will see we have done much

1 the same calculation here as we did with the previous
2 exhibit from the residential forecast.

3 DR. BUJA-BIJUNAS: A. That is correct.

4 Q. Right. And we have calculated the
5 change in consumption over the period 1989 to 2015, and
6 expressed that in terms of the per cent, percentage of
7 the overall change?

8 A. That is correct.

9 Q. Do those numbers appear accurate?

10 A. Yes, they are.

11 Q. By simple addition then we see that
12 the office equipment and miscellaneous categories
13 together comprise 42 per cent of the increase in
14 consumption that you'd expect to see in the end-use
15 categories through the year 2015?

16 A. That is correct.

17 Q. On the question, Doctor, of fuel
18 prices, and the relationship of that to your COMMEND
19 model, is it correct that COMMEND requires the use of
20 probability distributions of fuel prices, as inputs to
21 estimate future fuel shares?

22 A. We put in a fuel price forecast into
23 COMMEND, COMMEND 3.2.

24 Q. Yes. I'm instructed that to make
25 this model operate properly, that it requires a

1 probability distribution to represent the uncertainty
2 in the -- not to represent the uncertainty in the
3 forecast, but to represent decision-maker attitudes
4 towards fuels. You don't get a simple relationship.

5 A. There might be a -- I'd have to check
6 this out. I think there is a difference between 2.1
7 and 3.2.

8 One of the things that 3.2 now has is a
9 weighting factor for decision makers regarding how
10 strongly influenced they are by current prices versus
11 what the price might have been a year ago, et cetera,
12 which is a different way of looking at the influence of
13 prices on the decision maker versus his probability
14 distribution. So, I think there has been a change in
15 approach between the two models.

16 Q. In the 2.1 was there this probability
17 distribution?

18 A. I recall a probability distribution
19 in 2.1, but I don't recall one in 3.2.

20 Q. Have you done any statistical
21 analysis on the accuracy of the inputs used in COMMEND?

22 A. What we did was -- I wouldn't call it
23 statistical analysis. We did a run of COMMEND based
24 with 1982 data.

25 Q. Yes.

1 A. And again, using the real, you know,
2 prices that did occur from '82 to presently, and the
3 actual floor space that did materialize during that
4 period also.

5 This was done using the calibration of
6 COMMEND that we used for the 1990 forecast. So, this
7 is not default coefficients of COMMEND. This is how
8 well we reproduce historical data, starting in '82,
9 using COMMEND calibrated as we had calibrated it in
10 1990. So it is not the default version, but it is our
11 version of COMMEND.

12 Generally speaking the results were quite
13 good. For certain sectors in particular the results
14 were quite good. They were particularly good for
15 multi-res, offices and retail, and somewhat
16 underestimated the institutional sector.

17 Q. And do you use any of the defaults
18 from EPRI, or have you revised them all?

19 A. No, no, some of the parameters were
20 left as is.

21 What you do in the calibration is that
22 you give it, say, the marginal share of electric space
23 heating for offices, and you give it that parameter,
24 and it uses the default values to tell you what the
25 model would like to calculate as the marginal share.

1 So, you can compare that to what your actual number is,
2 and then do an auto calibration.

3 It matches your actual number, but you do
4 get a chance to compare how far off the model would
5 have wanted to calculate the marginal share. In some
6 cases the model better reproduced the results than in
7 others, but I can't tell you exactly which ones they
8 are. We certainly didn't adjust all the parameters.

9 Q. You didn't?

10 A. No, we did not.

11 Q. One of the key driving variables, of
12 course, we take from all of this is the square footage
13 by building type?

14 A. Yes.

15 Q. Is it fair to say that this is
16 essentially forecast by a simple econometric model?

17 A. Outside COMMEND, yes.

18 Q. Yes. And similarly, just before we
19 leave this, if we harken back for a moment to the
20 residential model dealing with the other category,
21 which we saw was so large, in essence that is something
22 which is forecast also with a simple econometric model?

23 A. I didn't quite hear the beginning of
24 that. You are wondering if the other category...

25 Q. I just wanted to take your mind back

1 to the discussion we had earlier today about the REEPS
2 model, the residential.

3 A. That is right, yes.

4 Q. We saw that your -- so much, 73 per
5 cent of your growth--

6 A. That is right.

7 Q. --over the period to 2015 is in the
8 "other" category.

9 A. That is right.

10 Q. Is it fair to say that that is a
11 forecast which is essentially derived from a simple
12 econometric model? You used a simple equation?

13 A. We needed a simple equation upon
14 which we added judgment to determine the final result.

15 Q. Right. And that is the equation from
16 which you have taken out price as a significant
17 variable?

18 A. Because it did not show up to be
19 significant on historical data, that is correct.

20 Q. And that is your data '82 to '88?

21 A. '81 to '88.

22 The '73 to '88 reference in the write up?

23 Q. Yes.

24 A. What that might refer to is that
25 there might have been an historical RAS back in the

1 '70s. So that there might have been a data point back
2 in '73, not necessarily any intervening data or some
3 sketchy data. We had to fill in some of the years.
4 But then you had it on a more regular basis from '81 to
5 '88. So, I think that is the discrepancy between my
6 stating '81 to '88, and saying the estimation was from
7 '73.

8 Q. But we are looking then at -- it is
9 the '81 to '88 data which underlies that?

10 A. It is a '73 to '88 data base, where
11 the '81 to '88 data is more frequently measured than
12 the '73 to '81 data.

13 Q. You can't properly run a regression
14 model on filled-in data, can you?

15 A. An awful lot of people do.

16 Q. That is not my question. Can you
17 properly run it on filled-in data?

18 A. You often have no other alternative.

19 Q. Just lastly on this, dealing with the
20 time period for which you do have some actual data, I
21 think '81 to '88--

22 A. '88.

23 Q. --is it fair to say there was really
24 no significant fluctuation in the price of electricity
25 in Ontario during that time period?

1 A. Yes, I think that is fair.

2 Q. So, it is not surprising that your
3 analysis would show no significant impact of price on
4 consumption?

5 A. That is fair, yes.

6 Q. But that is not to say, of course,
7 that consumption is not sensitive to price.

8 A. Not necessarily.

9 MR. MARK: Mr. Chairman, I do have a
10 little bit more. It may be half hour or so. I see it
11 is 5:00.

12 THE CHAIRMAN: We are not going to take
13 another half hour, unless -- is your colleague -- will
14 you need to finish today?

15 MR. MARK: No, Dr. Violette can be here
16 tomorrow, if we continue.

17 THE CHAIRMAN: So, it would be
18 satisfactory to continue tomorrow?

19 MR. MARK: Yes, that is fine.

20 THE CHAIRMAN: Then you think you are
21 going to be another half hour in total?

22 MR. MARK: Yes, I think that would be the
23 longest I would be, give or take ten minutes, yes.

24 THE CHAIRMAN: And then, Mr. Rodger, you
25 follow, is that correct?

1 MR. ROGERS: No, sir, I'm sorry...

2 THE CHAIRMAN: Mr. Rodger.

3 MR. ROGERS: Rogers.

4 THE CHAIRMAN: It was Mr. Rodger I was
5 speaking to, though. Because I think he is next,
6 aren't you?

7 MR. ROGERS: Oh. Well, I've been waiting
8 all day, so I will wait a little bit more.

9 THE CHAIRMAN: You are next, aren't you?

10 MR. RODGER: That is correct.

11 THE CHAIRMAN: And what is your estimate?

12 MR. RODGER: I think I will probably be
13 about an hour and a half.

14 THE CHAIRMAN: And then Mr. Rogers for
15 the Ontario Natural Gas Association.

16 MR. ROGERS: Yes, sir. And the reason I
17 was confused is because I made arrangements with my
18 friend to precede him today.

19 THE CHAIRMAN: Oh, have you.

20 MR. ROGERS: That is why, and I thought
21 you were aware of that.

22 THE CHAIRMAN: No, I'm not aware of that.

23 MR. ROGERS: And I thought you had told
24 your counsel that.

25 I can't be here tomorrow, I'm afraid, and

1 so with the Board's permission I will work it out with
2 one of my friends to permit me to slip in. I have very
3 few questions, but I would like to ask a few questions
4 of this panel, and it can't be tomorrow.

5 THE CHAIRMAN: Just a moment now. Before
6 we let you get off that easily, what about the North
7 Channel Advocates? Are they going to be asking
8 questions?

9 MR. ROGERS: They are asking questions
10 through the AMPCO counsel, I understand, sir.

11 THE CHAIRMAN: Well, I don't know if --
12 the next one after that is the Coalition of
13 Environmental Groups, so once they start, I don't want
14 to break into their testimony to put you in.

15 You have just got a few questions?

16 MR. ROGERS: Yes.

17 THE CHAIRMAN: Why don't we deal with you
18 tonight then?

19 MR. ROGERS: All right, if you are
20 prepared to do that.

21 THE CHAIRMAN: Is that all right, Mr.
22 Mark?

23 MR. MARK: That is quite satisfactory.

24 THE CHAIRMAN: Do you want to take a
25 break first?

1 MR. BURKE: No, that is all right.

2 THE CHAIRMAN: Neither do I.

3 MR. ROGERS: Thank you very much, Mr.

4 Chairman.

5 THE CHAIRMAN: We are not going to make a
6 habit of this.

7 CROSS-EXAMINATION BY MR. ROGERS:

8 Q. Ladies and gentlemen, I would just
9 like to deal for a very short time with your evidence
10 on your forecast of gas costs.

11 First of all, I guess you do this because
12 a forecast of gas cost has importance with respect to
13 your load forecast, in a couple of ways, Mr. Rothman.

14 First of all, to the extent that Ontario
15 Hydro competes with natural gas in certain areas, like
16 space heating, water heating, the price of gas may be
17 relevant to the amount of electricity that you will
18 sell?

19 MR. ROTHMAN: A. Yes.

20 Q. Secondly, the forecast of natural gas
21 costs is important to you because it may be a fuel that
22 you use to produce electricity.

23 A. Yes.

24 Q. And thirdly, I suppose it is
25 important to you, because natural gas is a potential

1 source of electricity through non-utility generation.

2 A. Yes.

3 Q. There may be other reasons as well,
4 but those are the three main ones I suspect?

5 A. Those are the mains ones.

6 Q. Now in your Exhibit 14, which is the
7 economics and forecasts division forecast, you forecast
8 natural gas costs.

9 A. Yes. That is the "Energy Price
10 Trends Report Annual Review, November 1990."

11 Q. Who does the actual forecast of gas
12 costs within Hydro?

13 A. You mean a person, name?

14 Q. Yes.

15 A. The name is Andrezej, A-n-d-r-z-e-j,
16 Zerek, Z-e-r-e-k.

17 Q. And is he someone within your group?

18 A. Yes.

19 Q. What is his title?

20 A. Economist.

21 Q. He's an economist, one of the
22 economists in your group?

23 A. He's an economist within the energy
24 economics section. We have tried not to have too
25 many -- to much paper work, so we give--

1 Q. Oh, really?

2 A. --pretty much everybody with the
3 same -- we try to keep the same job titles for as many
4 different individuals as possible.

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1 [5:05 p.m.] Q. I see. All right. Thank you.

2 A. So he has a title, Economist.

3 Q. Briefly, in general terms, can you
4 tell us how he forecasts gas costs?

5 A. Yes. There is, as I said in my
6 evidence-in-chief, there is a reasonably succinct
7 description of what is a fairly complex process in
8 interrogatory response, I believe it's 1.24.27. It
9 looks as if Mr. Burke is checking that for me.

10 Q. Yes, I have that.

11 A. Essentially this process is an
12 iterative one where he starts almost at any, or could
13 start almost at any point in that process that's
14 represented by the flow chart that you have there, and
15 works through that system using both some spread sheet
16 kind of analysis and a little bit of statistical
17 analysis and a lot of judgment in order to get to a
18 forecast that is consistent with both expected
19 conditions of demand and expected costs of production.

20 Q. All right, thank you. So he goes
21 through the process and imposes a lot of judgment.

22 A. Yes, there is a fair amount of
23 judgment.

24 Q. I am not critical of that. It is
25 necessary in the forecast to use judgment.

1 A. Yes.

2 Q. And the judgment in this case is
3 essentially that of your colleague whose name you gave
4 me.

5 A. Andrzej Zerek. It's easier to
6 pronounce than to spell.

7 Q. Now, there are other forecasters out
8 there who are attempting to do the same thing.

9 A. Yes.

10 Q. And they also are employing judgment,
11 I assume.

12 A. Yes. And of course Andrzej is in
13 touch with many of them. We subscribe to an external
14 forecasting service and we regularly can talk to such
15 forecasters as the National Energy Board. Actually, we
16 subscribe to two forecast services, DRI and Petroleum
17 Economics Limited, which is a British company.

18 Q. Thank you. Now, the last topic I
19 would like to discuss with you this evening is what has
20 happened to your forecast between your last forecast
21 and the most recent one, which I think is the one in
22 Exhibit 14?

23 A. Not much.

24 Q. Not much, but a little. As I
25 understand it, from reading this document, and I don't

1 think the Board needs to turn this up, you have,
2 between the period of time from the first forecast
3 until the second forecast was made, reduced - at least
4 in the short-term - your forecast of natural gas costs.

5 A. Yes.

6 Q. But you have not reduced your
7 long-term forecast, that is out to the year 2015, you
8 have left those as they were, more or less.

9 A. No, we have actually reduced our
10 forecast of real gas prices, that is prices in 1990
11 dollars at 2010 by some not insignificant amount.

12 The forecast that is indicated here was
13 \$6.02 per thousand cubic feet -- or million cubic feet
14 in 1988. The 1988 forecast was for a price of \$6.02.
15 The 1990 forecast was for a price of \$5.20. So, that
16 is a decrease of 8 over 60, or roughly one -- about 12
17 per cent. But the short-term forecast has in fact come
18 down significantly more than that. The 1992 forecast,
19 for example, has come down from \$4.10 to \$2.64, a
20 decrease of more than 30 per cent.

21 Q. Fine. So, between the '88 forecast
22 and this most recent forecast, you are now forecasting
23 that natural gas prices will be lower over the entire
24 term of forecast--

25 A. Yes.

1 Q. --in real terms?

2 As I understand this document with
3 respect to electricity prices over that same period,
4 you are now forecasting that electricity prices will be
5 higher than you thought in 1988 over the whole forecast
6 period?

7 A. That's correct.

8 Q. Nevertheless, you are forecasting
9 that natural gas prices will what, about double over
10 the time frame in real terms?

11 A. Yes, about double.

12 Q. But your forecast is that electricity
13 prices will only increase - now that you say they will
14 increase - by about 30 per cent or so in real terms
15 over the same period.

16 If you look at the first page of the
17 document, Mr. Rothman, that's where I got that number.

18 A. Yes, I don't disagree with your
19 number. I am just wondering why I have a different one
20 in some of my other material.

21 A. It's about 20 per cent, it's not 25.

22 Q. Now, if your forecast of electricity
23 prices is too low, that is to say electricity prices
24 rise more rapidly than your forecast, and if natural
25 gas prices turn out to be lower than you were

1 forecasting, what effect would that tend to have on
2 your load forecast?

3 A. Well, I would ask Mr. Burke to help
4 me, perhaps, with this, but as I recall his evidence,
5 it's been that there hasn't been a high cross-price
6 elasticity between gas and electricity, that we are not
7 forecasting electricity prices to come into a range
8 where they would be competitive with gas in most uses.

9 Mr. Burke?

10 Q. Mr. Burke, you did allude to this --
11 not allude, you explained to us through your graph, I
12 believe, that if that were to happen within a certain
13 band at least, there would be very little impact on
14 your load forecast.

15 MR. BURKE: A. That's correct.

16 Q. And it would take a marked
17 differential before we would see the effects in the
18 load forecast.

19 A. That's correct.

20 Q. Is a plus or minus 20 per cent, let
21 us say just for comparison purposes here, if
22 electricity costs were to increase by 20 per cent and
23 gas costs were to be 20 per cent lower than you are
24 forecasting, would that be sufficient to affect your
25 load forecast?

1 A. The change in electricity prices
2 would affect the load forecast. The change in the gas
3 prices probably wouldn't, in the range we are talking.

4 Q. So, the answer is yes, but
5 principally because of the change in electricity
6 prices?

7 A. That's correct.

8 MR. ROGER: Thank you very much.

9 Thank you, Mr. Chairman, for your
10 indulgence. There will be much more evidence on gas
11 cost forecasts later.

12 THE CHAIRMAN: All right, Mr. Rogers,
13 thank you.

14 We will now adjourn until tomorrow
15 morning at ten o'clock when we will continue with the
16 cross-examination by the MEA.

17 ---Whereupon the hearing was adjourned at 5:15 p.m.
18 to be resumed on Tuesday, April 30, 1991, at
19 10:00 a.m.

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